

8/15/91

GZA
GeoEnvironmental, Inc.

*Engineers and
Scientists*



USEPA SF



1415857

**ENVIRONMENTAL SITE EVALUATION
BOISE TOWNE SQUARE
BOISE, IDAHO**

PREPARED FOR:
The O'Connor Group
New York, New York

PREPARED BY:
GZA GeoEnvironmental, Inc.
Newton Upper Falls, Massachusetts

August 1991
File No. 12600

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August 15, 1991
File No. 12600-C,PC

Mr. James Flaum
The O'Connor Group
200 Park Avenue
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Re: Environmental Site Evaluation
Boise Towne Square
Boise, Idaho

320 Needham Street
Newton Upper Falls
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617-969-0050
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Dear Mr. Flaum:

In accordance with our proposal dated July 3, 1991, GZA GeoEnvironmental, Inc. (GZA) has conducted an environmental site evaluation of the Boise Towne Square Mall property in Boise, Idaho. This report has been prepared in accordance with the Limitations and Terms and Conditions set forth in Appendix A.

This report describes the conditions observed by GZA at the study site. The text presents the observations made during our site reconnaissance, a review of previous work at the site, information gathered during site history research and regulatory agency file review, and results of subsurface exploration and chemical analysis of soil and groundwater.

On the basis of the observations made and the information reviewed during the course of this site evaluation, it is GZA's opinion that the available evidence indicates that hazardous material in the form of PCE present in the soil and groundwater at the site. A probable source of the contamination is former users of an abutting property.

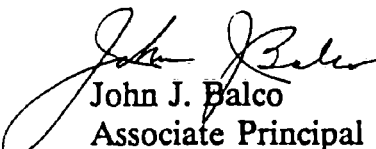
A Subsidiary of GZA
GeoEnvironmental
Technologies, Inc.

Please note that the data on which this opinion is based is presented in the attached report and summarized in Section 7.00.

We have appreciated the opportunity to work with you on the project. Should you have any questions, please call the undersigned.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.


John J. Balco
Associate Principal


Sara R. Hanna
Project Reviewer

SRH/JJB:crp

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1.00 INTRODUCTION

In accordance with our proposal dated April 19, 1991, GZA GeoEnvironmental, Inc. (GZA) has completed an environmental site assessment of Lot 1 of the Boise Towne Square Mall property in Boise, Idaho. The purpose of this assessment was to render an opinion on the presence of hazardous material or oil in soil and groundwater at the site. The scope of services included:

- a site visit;
- a review of site history;
- a review of previous studies;
- contact with certain local and state officials regarding possible environmental concerns at or near the subject site;
- subsurface explorations in the form of shallow test borings and groundwater monitoring wells installations;
- sampling of the groundwater monitoring wells;
- limited screening of the soil and groundwater samples at GZA's Environmental Chemistry Laboratory in Newton, Massachusetts; and
- the preparation of this report containing an opinion as to the presence of hazardous material or oil in the soil or groundwater at the site.

This report has been prepared in accordance with the Limitations and Statement of Terms and Conditions in Appendix A.

2.00 BACKGROUND

The following paragraphs describe the physical layout of the site, its hydrogeologic setting, and the history of the site use.



2.10 SITE DESCRIPTION

The study site consists of a portion (Lot 1) of the newly developed (1986-88) Boise Towne Square shopping mall property located in the southwest section of Boise, Idaho; a Site Locus is provided on Figure 1. The entire mall property is comprised of 14 lots but the focus of the present study area is on Lot 1 only. The site, Lot 1, is comprised of portions of the main mall building, parking areas, a detention pond, and three separate roadways which provide access to the site.

The mall property is abutted to the north by residential properties and farmland beyond which lies Emerald Street which generally extends in an east/west direction approximately 500 feet to the north of the site. Further to the north of Emerald Street are more residential and undeveloped properties.

A Union Pacific Railroad easement, which extends in an east/west direction, abuts the site to the south. Approximately 200 feet to the south of the easement lies Franklin Road which also extends in an east/west direction with a variety of newly constructed commercial facilities.

Cole Road, which extends in a north/south direction, abuts extreme eastern portions of the site. Further to the east beyond Cole Road are a mixture of office and residential properties. Western portions of the site are bordered by Milwaukee Street which generally extends in a north/northwest direction. Beyond Milwaukee Street to the west is the newly developed Westpark Commercial Plaza followed by an area characterized primarily by office and industrial land uses.

Interstate 184 abuts southeastern (upgradient) portions of the property. Approximately 600 feet further to the southeast lies the intersection of Cole and Franklin Roads. This area is characterized by a variety of commercial and office-related land uses. A summary of the facilities immediately to the southeast (within 1/4-mile) that have the potential to be upgradient of the site is provided in the following table. Refer to Figure 2 for the approximate locations of these facilities relative to the study site; additional information concerning groundwater flow directions is provided in Section 2.20 below.

Facility	Location	Distance from site (approximate)
Boise Motor Village	Several dealerships along Auto Drive	1000 feet
Sinclair Gas Station	SW corner of Cole and Franklin Roads	900 feet



Facility	Location	Distance from site (approximate)
Former Borah Heights Gas Station	SE corner of Cole and Franklin Roads	1,000 feet
Zellerbach	200 ft. north of NW corner of Cole and Franklin Roads	500 feet
Cissi Distribution Center	200 ft. north of NE corner of Cole and Franklin Roads	600 feet
Pioneer Coatings	7265 Bethel Street	1,000 feet
Amana Cooling & Heating Facility	7235 Bethel Street	1,200 feet
Sears Service Center	7095 Bethel Street	1,500 feet

2.20 TOPOGRAPHY AND DRAINAGE

As a result of the recent development of the property, the site is covered predominately by impervious areas such as building rooftops and paved parking lots. Paved portions of the property have been sloped to divert stormwater to a series of catch basins situated throughout the site. Stormwater is transported and discharged to the Ridenbaugh Canal which flows in a northwesterly direction, just off the eastern portion of the property. A stormwater detention basin exists on the north/central portion of the property which is designed to accept stormwater produced by unusually high rainfall events. A second detention basin is located on Lot 12, abutting the site to the northeast.

According to the U.S. Geological Survey topographic quadrangle map of the area (Cloverdale Quadrangle dated 1953 and photorevised in 1979) the topography of the study site prior to development sloped mildly to the northwest. Reports prepared by others (summarized in Section 2.50) indicate groundwater flow is toward the northwest. Based on a preliminary review of the site's predevelopment topography, the general northwesterly slope of the surrounding area, and reports of others, GZA anticipates that groundwater flow is generally to the northwest. Localized surface water and groundwater flow directions in the vicinity of the site may vary, however, due to variations in areal recharge and evapotranspiration rates, man-made influences (e.g. buildings, paved areas, underground utilities) and heterogeneous subsurface conditions. Subsequent references in the report to upgradient and downgradient directions in relation to the site are relative to GZA's anticipated northwesterly direction of groundwater flow.

2.30 SITE HISTORY

To obtain information regarding the history of the site, GZA contacted the Ada County Assessor's Office and Building and Planning Department. Additionally, previous site occupants and site abutters were contacted to obtain information regarding the history of pre-existing commercial facilities along extreme southern portions of site. A listing of the individuals/agencies contacted to obtain the historical information is attached as Table 1.



It should be noted that the entire mall property has recently (1989) been subdivided into 14 separate lots. The present owners of these lots are summarized as follows:

•	Lots 1,2,4,9,10,11,12,13	Boise Mall Development Co.
•	Lot 3	General Mills Restaurant, Inc.
•	Lot 5	Ole International Food Corp.
•	Lot 6	Pier One Group, Inc.
•	Lot 7	JC Penney Property, Inc.
•	Lot 8	Mervyn's
•	Lot 14	Sears and Roebuck

The study site of this report, Lot 1, is the largest of the lots with a total area of approximately 39.3 acres. The approximate boundary of Lot 1 relative to the rest of the mall property is presented on Figure 2. The following paragraphs generally describe the history of the entire mall property (Lots 1 to 14). Where appropriate, individual lots will be discussed separately in order to distinguish between the history of the site as compared to that of the entire mall property.

According to conversations with personnel at the Ada County Assessor's Office, the Boise Mall Development Company acquired large portions of the mall property from William and Martha Moseley and Allen and Billy Nobel in January 1987. Property owned by Monty Brooks and Shirley O'Riely of Nielsen Transfer and Storage was acquired by Boise Mall Development Company in April of 1987, and property owned by Margerie Hintze of Quality Electric was acquired in July of 1987.

Mr. Bob Garrison of the City of Boise Building Department indicated that the area of the Boise Towne Square Mall was only recently incorporated from Ada County and that his department would therefore have no historical information pertaining to the study site. Mr. Garrison referred us to the Ada County Building and Planning Department.

Records at the Ada County Building and Planning Department documented that southern portions of the site were historically zoned for industrial use but that the

property is presently zoned for commercial use. No other relevant historical information was made available to us at this department.



The most relevant and complete information regarding the historical industrial/commercial uses of the southern portion of the site was obtained through conversations with the owners of the pre-existing facilities noted above. Prior to the development of the mall property (1986-88), two facilities were located on the south side of Friedly Street which, until the development of the mall, extended through the southern third of the site in an east/west direction. These two commercial facilities were located primarily on Lots 6 and 7 and extended to a portion of what is now Lot 1.

Mrs. Margerie Hintze, the owner of Quality Electric (an electrical contractor), noted that their facility was the furthest one to the east and that it consisted of the main building fronting on Friedly Street, a long storage/garage building that extended north/south just south of the main building, and an unpaved, gravel area further to the south that was used for miscellaneous storage of equipment. Mrs. Hintze noted that they did have a private well that was tested approximately once a year by State of Idaho Department of Health. According to Mrs. Hintze there were never any reported problems with the quality of their well water; however, analytical results were not available. Mrs. Hintze also noted that their facility did maintain an aboveground storage tank for the storage of fuel oil and that the tank was removed as part of the demolition of the building in 1987. Mrs. Hintze noted that they occupied the site for approximately 15 years.

The Nielsen Transfer and Storage Company occupied the next facility to the west from approximately 1973 to 1981 when the company was purchased by Air Van North American. The Vice President of Air Van North American noted that his Company remained at the location after 1981 but that the previous owners of Nielsen Transfer and Storage maintained ownership of the building and property until it was acquired by Boise Mall Development Company in 1987. He also indicated that Van Waters and Rogers (a chemical distribution company) leased eastern portions of the building from approximately 1973 to 1981. Refer to Section 3.00 for more discussion of the Van Waters and Rogers facility.

A third commercial facility was located further to the west where the present movie theater is situated. This off-site facility was a construction supply warehouse owned by J. Kosterman who reportedly occupied the property during the same period as the other on-site facilities (approximately 1973 to 1987).

2.40 AERIAL PHOTOGRAPHS

In an effort to obtain additional information concerning historical site conditions, we reviewed aerial photographs of the site and locale maintained by AP Mapping located in the Boise City Hall. Aerial photographs for the years 1975, 1980, 1985 and 1990 were available for review. Copies of these photographs are included in Appendix B.



The 1975, 1980, and 1985 photographs are very similar and show the site as being comprised primarily of farmland with several scattered residential dwellings located primarily on the eastern portion of the site. The photographs show the three previously-mentioned commercial/industrial facilities extending east to west just south of Friedly Street.

The photographs document that a railroad spur extended in an east/west direction along the southern (back) portion of the Nielsen Transfer and Storage Building, paralleling the main tracks which are presently located approximately 50 feet to the south. Parking areas associated with each of the facilities were also depicted on the photographs. Many apparent truck trailers were observed in a parking area to the north of the Nielsen Building. A portion of the parking lot is apparently on what is now indicated as Lot 1; the building is not.

The 1990 photograph documents the most dramatic change of the four photographs. By this time the mall had been constructed and all the on-site residential and commercial buildings had been removed. The Westpark Commercial Plaza located across Milwaukee Street to the west/northwest of the site was also constructed by this time.

2.50 PREVIOUS STUDIES

The following studies of the site, provided by the owner, were conducted by Dames and Moore during, and after, the development of the mall property:

- March 1986 "Soils and Foundation Investigation for The Proposed West Park Mall"
- April 1988 "Phase I, Environmental Reconnaissance"
- March 1989 "Baseline Groundwater Assessment Report-Mervyn's Parcel"

The 1986 report was a geotechnical study for the entire mall property. Although chemical screening and testing of soil and groundwater samples was beyond the scope



of the study, groundwater was encountered in eight test borings. The report noted that there were no areas of obvious contamination observed during the course of the study.

An initial "Phase I" environmental assessment was performed on the Mervyn's (property "C" on site plan) portion of the mall property in April 1988. No subsurface explorations were performed as part of the assessment. The study "uncovered no visual, historical, or documented evidence that toxic or hazardous materials or waste exists or has existed in any portions of the site (Mervyn's parcel), except possibly normal applications of pesticides and herbicides during the past agricultural activities, and possible minor spills of oil and gas products from farm machinery and automobiles."

A Phase II environmental assessment was subsequently performed on the Mervyn's parcel in March of 1989. The study was apparently undertaken because of the results of another study--summarized below--indicating groundwater contamination of a downgradient property. As part of that study, soil and groundwater samples from five wells were tested for a variety of organic and inorganic parameters. The results of the study concluded that "the water quality beneath the Mervyn's parcel is of high quality and exhibits no indication of contamination."

In addition, we reviewed portions of a report in the State of Idaho files regarding conditions at a nearby site. A 1988 study conducted by Special Resource Management, Inc. (SRM) of the Westpark Commercial Plaza, located across Milwaukee Street to the west/northwest and downgradient of the mall property, identified low to moderately high levels of tetrachloroethene (PCE) in the groundwater. (This study apparently followed a study referenced to have been completed on November 6, 1987, which was not available to GZA at the time of this assessment, when PCE was detected in groundwater.) Low levels of PCE were also detected in the soil that, according to SRM, were most likely the result of vapors travelling through the soil pore space. The report stated that "Results to date indicate the tetrachloroethene is present in a narrow plume oriented northwest across the west half of Parcel 1. The groundwater flow within Parcel 1 has been determined to be northwest. The origin or source of contamination has not been identified." The highest concentrations in the center of the plume range from 1,000 parts per billion (ppb) to 2,000 ppb. An air stripping tower was installed at the facility in 1989 to treat the contaminated groundwater and has been operating ever since. Verbal information supplied by State of Idaho personnel indicates that the treatment system is operational, that the target treatment level is 10 ppb PCE, and the treatment target is apparently being achieved. No information was available regarding when treatment could expect to be terminated.

3.00 REGULATORY INFORMATION CONCERNING SITE AND VICINITY



Certain state and local agencies were contacted to assess whether hazardous materials may have been released into the soil or groundwater at or near the site. Some of the information was developed by telephone contact; other information is the result of direct interviews and visits. The information made available to GZA during these visits, interviews and file reviews is summarized in the following paragraphs. Refer to Table 1 for a list of individuals/agencies contacted.

3.10 CITY AGENCY FILE REVIEW

To obtain information concerning the possible release of hazardous material or oil at or near the study site, GZA contacted the City of Boise Public Works, Fire, and Building Departments. The Ada County Building and Planning Department was also contacted for site-specific information.

Mrs. Catherine Chertudi of the Environmental Division of the Boise Public Works Department informed GZA that it is believed that Van Waters and Rogers maintained an aboveground storage tank (AST) for the storage of PCE. (Although a portion of the Van Waters and Rogers operations appeared to have occupied Lot 1, it appears that the tank was located near the eastern section of the then existing building. It thus was not located on what is now Lot 1.) Among other activities, Van Waters and Rogers was reportedly a distributor of PCE to regional dry cleaning establishments and the AST was reportedly filled via railroad cars that traversed the southern (back) portion of the facility. Mrs. Chertudi also noted that shallow soil samples (approximately 2 feet deep) were obtained from the former Van Waters and Rogers Facility in the spring of 1989 by Mr. Ronald Lane of the State of Idaho Department of Environmental Quality (DEQ).

We contacted Mr. Lane and were informed that, during the time of sampling (April 5, 1989), the Pier One Imports Store that presently exists was under construction, and portions of the parking area were still unpaved, allowing the samples to be obtained. Four shallow soil samples were obtained in the vicinity of the pre-existing AST, just to the east of the Pier One Imports building pad. Of the four samples obtained, one was selected for chemical analysis using EPA Method 5030. PCE was detected in the soil sample at 62 ppb in addition to a trace amount (< 1 ppb) of trichloroethylene (TCE) and two unidentifiable chlorinated compounds.

Mr. Lane also noted that the pre-existing AST had a capacity of 6,000 gallons and was maintained at the facility from approximately 1972 to 1981. This time frame corresponds to the period when Van Waters and Rogers occupied the property.



Captain Wayland Johns of the Boise City Fire Department confirmed that the Van Waters and Rogers facility was a chemical distributor. Mr. Johns had no further information on the former facility nor did he know of any reported incidents involving oil or hazardous materials at, or in the immediate vicinity of, the study site.

As previously noted, the Ada County Building and Planning Department confirmed that portions of the mall property were once zoned for industrial/commercial use. Other key information (i.e. records of building demolition permits, etc.) were unavailable at this department.

3.20 FEDERAL AND STATE AGENCY FILE REVIEW

As part of our federal and state agency file review, we retained the services of Environmental Audit Inc. (EAI) to provide us with a list of facilities in the vicinity of the site that are identified on various EPA (federal) and state lists. The lists that were reviewed and facilities that were identified are discussed in the following subsections.

3.21 Federal

The National Priorities List (NPL) is EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund Program. There were no NPL-listed facilities within 1/4 mile of the site.

The Facility Index System (FINDS) is a compilation of any property or site which the EPA has investigated, reviewed or been made aware of in connection with its various regulatory programs. According to EAI's search, there are seven FINDS-listed facilities within 1/4-mile of the site, as listed below. These facilities were listed as hazardous waste generators under the Resource Conservation and Recovery Act.

Facility	Address	Location from site (approximate)
Pioneer Coatings	7265 Bethel Street	1,000 ft. southeast
RC Bigelow	315 Benjamin Lane	1,200 ft. west
Home Club 50	8363 W. Franklin St	1,300 ft. southwest
Miller-Stephan Honda/Hyundai	7710 Gratz Drive	1,000 ft. southeast
Miller-Stephan Pontiac/Cadillac	233 Auto Drive	1,000 ft. southeast
Sundance Dodge, Inc	222 Auto Drive	1,000 ft. southeast
Treasure Valley VW, Inc.	123 Auto Drive	1,000 ft. southeast

There were no files available for any of the above-listed facilities at the State of Idaho DEQ.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by EPA of reporting facilities that generate, store, transport, treat or dispose of hazardous waste. EAI identified nine RCRA facilities within 1/4-mile of the site. These facilities include the seven FINDS Sites listed above in addition to the following:



Facility	Address	Location from site (approximate)
American Trailer Manufacturing	8645 Westpark St.	1/4 + -mile west/southwest
Micron Memory Applications	8455 Westpark St.	1/4 + -mile west/southwest


Of the nine RCRA facilities within the vicinity of the site, only one facility, the downgradient American Trailer Manufacturing facility, had a file at the DEQ. Mr. Lee Castanzo of the DEQ Hazardous Materials Division reported that information in the file suggests that compliance inspection violations were cited at the facility in October of 1989. It is not known what these violations were but it is known that they have since been resolved.

The CERCLIS List is a compilation of the sites which EPA has investigated or is currently investigating for a release, or threatened release, of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Superfund Act). According to EAI's report, there are no CERCLIS-listed facilities within 1/4-mile of the study site.

EAI also reviewed the 1989 OPEN DUMP inventory of facilities that do not comply with the Environmental Protection Agency's Criteria for classification of solid waste disposal facilities. According to EAI, there are no such facilities within 1/4 mile of the study site.

The Emergency Response Notification System (ERNS) is a national database to collect information on reported releases of oil and hazardous substances. The database contains information from spill reports made to federal authorities including the EPA, the US Coast Guard, the National Response Center and the Department of Transportation. According to the information provided to us by EAI, there are no ERNS sites in the vicinity of the study site.

3.22 State

 Based on the findings of the SRM study (summarized in Section 2.50) and the detection of PCE in drinking water supplies of a trailer park downgradient of the study site, the State of Idaho Division of Environmental Quality (DEQ) is conducting an investigation into the possible source of the PCE contamination identified in the SRM report. (Public water has been subsequently supplied to trailer park residents.) State personnel consider the former Van Waters and Rogers operation as a likely source of PCE contamination. As part of this study, DEQ has recently installed two observation wells immediately upgradient of the Boise Towne Square Mall property and two monitoring wells on the mall property. The locations of the State wells (MW-1 through MW-4, shown on Figure 2) were chosen to assess the potential impact that the pre-existing on-site commercial facilities discussed earlier may have had on the groundwater in the area. (See Section 6.22 for results of a chemical analyses of groundwater from these wells.)

A review of the Idaho Underground Storage Tank (UST) Facility Listing maintained by the State of Idaho Bureau of Water Quality revealed the following facilities within 1/4-mile of the site with registered (past or present) USTs.

Facility	Address	Approximate Location
Miller-Stephan Pontiac Cadillac	233 Auto Drive	1,000 ft. southeast
Sundance Dodge, Inc.	222 Auto Drive	1,000 ft. southeast
Lyle Pearson Co, Inc.	351 Auto Drive	1,000 ft. southeast
Treasure Valley VW, Inc.	123 Auto Drive	1,000 ft. southeast
Miller Stephan Hyundai	7710 Gratz Drive	1,000 ft. southeast
Sears Roebuck and Co.	7095 Bethel Street	1/4-mile east
Air Van North American	7735 Friedly Drive	Formerly on-site
Borah Heights	7300 Franklin Road	900 ft. southeast

All the above-listed facilities have the potential to be upgradient from the study site.

The former Borah Heights gasoline station located at the corner of Cole and Franklin Road was the only facility with a file at the DEQ. According to information in the Borah Heights file, soil contamination was noted at the facility in the spring of



1990 when USTs were being removed as part of the demolition of the building. The soil contamination was remediated by the excavation and removal of approximately 5,000 cubic yards of soil. Groundwater contamination by gasoline constituents was remediated by pumping groundwater from an excavation into a sprinkler-type spray system designed to aerate and strip the volatile hydrocarbons from the groundwater. The treated water was then discharged into a storm drain which feeds into the Ridenbaugh Canal. Sampling of the groundwater in the spring of 1991 revealed that contamination was not present in wells downgradient from the former gasoline station but that low levels of hydrocarbon contamination were still present in the groundwater underlying the former Borah Heights property.

In addition to the above-listed facilities, the following sites have also been identified as having USTs within 1/4-mile of the study site.

Facility	Address	Approximate Location
Sinclair Gas Station	SW corner of Cole and Franklin Road	1,000 ft. southeast
Chen-Northern, Inc.	370 Benjamin Lane	800 ft. west

The Sinclair Gasoline Station is an operating gasoline station located upgradient from the site at the corner of Cole and Franklin Road, just west of the former Borah Heights Gasoline Station. There was no file information regarding this facility at the DEQ.

A file was available for the second facility, Chen-Northern, located approximately 800 feet and downgradient from the study site. According to information in the file, a hydrogeologic investigation of the site was conducted in March of 1991. The report noted that a 1000-gallon UST was decommissioned at the facility in December of 1988. The tank was reportedly installed in 1978 and was used for the storage of unleaded gasoline. According to Chen Northern's 1991 report, the removed UST has caused elevated levels of BTEX contamination in the groundwater at the facility.

4.00 SITE RECONNAISSANCE

On June 27, 1991, GZA engineer William P. Paul visited the site to observe surficial conditions for evidence of the presence of hazardous materials or oil. Mr. Bob Mitchell, the general manager of the mall, accompanied Mr. Paul during portions of the site reconnaissance. An area reconnaissance was also performed by Mr. Paul on



June 28 and 30, 1991. The primary purpose of the area reconnaissance was to identify facilities that, because of their proximity and upgradient location, have the potential to impact the soil and groundwater at the site.

Due to the size and nature of the property (a large, newly developed mall with many retail tenants), we focused our interior site reconnaissance on those areas that are more likely to store and use hazardous materials or oil (i.e. maintenance rooms, service areas, etc.). The following subsections describe GZA's observations of interior and exterior portions of the site, respectively.

4.10 INTERIOR OBSERVATIONS

As previously noted, the interior portion of the mall is comprised of a variety of retail tenants typical of a mall development. The entire building is heated by natural gas and is serviced by the municipal sewer and water systems. Floor drains located throughout the building are reportedly connected to the city sewer system.

The office and maintenance portion of the building is situated in the southwest corner of the building, just north of the main entrance to the mall. A room that is used to operate maintenance and grounds-related activities is located in this area. No floor drains were observed. The room contained minor amounts of stored chemicals including gasoline and oil for the maintenance equipment and small quantities of the herbicide "Roundup" which is used to control weeds in landscaped portions of the site.

4.20 EXTERIOR OBSERVATIONS

Outside of the above-mentioned maintenance room is a concrete-lined service area that contains a dumpster, a pad-mounted generator, and an aboveground, pad-mounted storage tank used to store diesel fuel for the generator. A pad-mounted transformer was also observed in this area that, because of its relatively new age, is unlikely to contain polychlorinated biphenyl (PCB) contaminated dielectric fluid. Also in this area were two 55-gallon drums and one 10-gallon container of waste oil. The waste oil was collected from maintenance machinery used on site. The concrete surface of the service area is sloped to a centrally-located storm drain that is believed to be connected to the municipal sewer system. There were no significant amounts of staining observed on the concrete at any location within this area.

Several other service areas of this type were observed at other locations around the perimeter of the mall building. These remaining service areas, however, typically contained only a pad-mounted transformer and an open concrete-lined loading area. No staining or hazardous materials or oil were observed at any of these additional service areas.

Minor areas of surficial gasoline and/or oil staining typical of parking areas and roadways were observed throughout outer, paved portions of the site. Runoff across paved portions of the property would likely "wash" these surficial pollutants from the parking lot and discharge them into the Ridenbaugh Canal or into the detention pond.

5.00 FIELD EXPLORATION, SAMPLING AND ANALYTICAL PROGRAM



GZA completed a field exploration program as part of the present assessment to further assess the presence of oil or hazardous materials in soil and groundwater at the site. This program consisted of the execution of six borings (GZ-1 through GZ-6) with subsequent well installations in each, and the collection and analysis of soil and groundwater samples from each of the six wells. Groundwater sampling and analysis was also conducted of two wells (MW-1 and MW-2) that were concurrently installed by the State of Idaho DEQ.

To the extent feasible, exploration locations were selected to obtain soil and groundwater samples from upgradient and downgradient areas of the site and near identified potential sources of hazardous materials and oil. Based on a site plan provided by the mall owner, we believed during the time of our exploration program that the site consisted of the entire property as defined on the plan entitled "Boise Towne Square" prepared by Forsgren-Perkins Engineering and supplied to us by our client. We were later made aware that the "site" consists only of only Lot 1 as defined on the Ada County Assessor's map of the Towne Square Plat. As a result, borings GZ-3 and GZ-6 were located "off-site" on Lots 8 and 2, respectively. Refer to Figure 2, Exploration Location Plan, for the locations of the borings.

5.10 SUBSURFACE EXPLORATIONS AND MONITORING WELL INSTALLATIONS

On June 29 and 30, 1991, six borings were completed by Environmental West Exploration, Inc. of Spokane, Washington. Air rotary drilling techniques were employed using a pneumatic down-the-hole hammer equipped with an ODEX-type drilling bit designed to advance the casing simultaneous to drilling the borehole.

A monitoring well consisting of 10 feet of 2-inch-diameter PVC wellscreen attached to solid PVC riser pipe was installed in each boring. All PVC attachments were completed without the use of solvents or glues to prevent contamination. The wellscreen was set to span the water table encountered in the boring during drilling. A filter of clean silica sand was placed in the annular space around the wellscreen, and a bentonite clay seal was placed above this filter sand. Each well was completed with

a flush-mounted protective cover cemented in place and bolted shut. Well installation details are presented on the boring logs in Appendix C.

5.20 SOIL AND WATER SAMPLING

Split spoon soil samples were obtained by Standard Penetration Tests at 5-foot intervals during the drilling operations. Soil samples were classified by the on-site engineer; boring logs developed by GZA are attached as Appendix C. A portion of each soil sample was collected in a glass jar, stored in an ice-packed cooler, and transported under chain-of-custody procedures to GZA's Environmental Chemistry Laboratory in Newton, Massachusetts for chemical screening.

GZA personnel sampled the monitoring wells at the study site on June 30 and July 1, 1991. We sampled wells installed by GZA and, with the permission of state personnel, the two wells (MW-1 and MW-2) installed by DEQ. Water samples were obtained using 3-foot PVC bailers with Teflon ballcheck valves. A separate bailer was used for each well to avoid cross-contamination. Approximately five times the initial standing volume of the groundwater in the well was evacuated to remove stagnant water, and the well was allowed to recharge. Water samples were collected in 40-ml vials with Teflon septa, in 8-ounce jars, and in 1-liter amber glass containers. The samples were kept cool until their delivery to GZA's Environmental Chemistry Laboratory.

GZA measured water levels in each monitoring well at the time of sampling. The depths to the water table from ground surface ranged from 10.2 feet in GZ-5 to 22.8 feet in GZ-3. Water level measurements for each well are indicated on the well logs in Appendix C.

5.30 CHEMICAL SCREENING OF SOIL AND WATER SAMPLES

Soil samples collected from the site were screened in GZA's laboratory for total volatile organic compounds (VOCs) using an H-Nu Model PI-101 photoionization detector (PID) with a 10.2 electron volt lamp. The PID measures relative levels of VOCs referenced to a benzene in air standard. Although the PID screening cannot be directly used to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator of the levels of VOCs in each sample. Results are discussed in Section 6.21.

Groundwater samples were screened for VOCs using a Hewlett Packard Model 5890A gas chromatograph (GC) and static headspace techniques. The GC screening analysis permits the tentative identification and approximate quantification of individual VOCs. A description of GZA's GC screening procedures of soil is also included in Appendix D; results are discussed in Section 6.22.



In addition, groundwater samples were screened in the field for pH and specific conductance immediately following collection. The pH is a measure of the acid or basic nature of water, and specific conductance is a measure of dissolved ions in water. An Orion Research Model 701A Digital Ionalyzer was used to measure pH, and an Extech Model 440 Digital Conductivity Meter was used to measure specific conductivity.

Based on the presence of known USTs in the area, one groundwater sample (GZ-4) was subjected to hydrocarbon fingerprinting analysis in accordance with modified ASTM Method D3328. This analysis is used to tentatively identify the type and concentration of petroleum hydrocarbon, if present, in the groundwater.

6.00 FIELD EXPLORATION AND ANALYTICAL RESULTS

The field exploration program consisted of the completion of six borings to depths ranging from approximately 20 to 35 feet below ground surface. The soil conditions described below are summarized from the boring logs attached as Appendix C.

6.10 SUBSURFACE CONDITIONS

Subsurface conditions were fairly uniform across the site. Sand and gravel fill layers were encountered in borings GZ-2, GZ-3, and GZ-6 to depths of 10, 8, and 5 feet, respectively. Underlying the fill layers in these borings and the parking lot subbase in the remaining borings was an average 5-foot thick layer of clayey silt. Following the clayey silt layer in every boring was a layer of fine to coarse sand, gravel, and cobbles that extended throughout the remainder of each boring. Visual and olfactory observations of the soil samples collected during drilling did not suggest obvious chemical staining or odors on the soil samples.

6.20 RESULTS OF CHEMICAL ANALYSES

A total of 25 soil samples and nine groundwater samples (including a trip blank) were returned to GZA's Environmental Chemistry Laboratory for screening analyses. Screening results are contained in Appendix D and summarized below.

6.21 Soil

As described in Section 5.30, soil samples were screened for the presence of total VOC vapors using an HNU Model PID. These screening results have been summarized on Table 2. Review of these data reveals that elevated VOCs were detected in only two samples (GZ-3; S-7 and GZ-4; S-5) above the level which GZA

considers background (1 part per million, or ppm). Note, however, that these readings were obtained on soil samples below the water table. Accordingly, the screening results of these samples are likely to be indicative of groundwater conditions at the site rather than soil contamination.

6.22 Groundwater



As noted in Section 5.30, pH and conductivity screening was performed on the groundwater samples in the field immediately following collection. The results of this testing are as follows:

Location	pH standard units	Temperature degrees celsius	Conductivity umhos/cm
GZ-1	7.42	18.0	460
GZ-2	7.73	19.0	799
GZ-3	7.83	18.1	740
GZ-4	7.92	16.0	758
GZ-5	7.90	16.9	630
GZ-6	7.91	17.0	778
MW-1	7.73	17.1	814
MW-2	7.42	18.0	960

Conversations with personnel at the State of Idaho DEQ suggest that the values obtained for pH and specific conductance are representative of values commonly observed in the groundwater of the area.

The results of the GC volatile organic compound screening are summarized as follows:

Location	Compound(s)	Concentration (ppb)
GZ-1	None detected	---
GZ-2	None detected	---
GZ-3	None detected	---



1. The study site consists of a portion (Lot 1) of the newly developed (1986-88) Boise Towne Square Shopping Mall property located in the southwest section of Boise, Idaho. The site is comprised of portions of the main mall building, parking areas, a detention pond, and three separate roadways that provide access to the property. Other than small quantities of cleaning materials, there do not appear to be hazardous materials or oil used at the study site.
2. Although most of the study site appears to have been undeveloped prior to 1986, a small industrial development area was located on the extreme southern section of the study site. From approximately 1973 until 1981, one of these industrial sites was occupied by Van Waters and Rogers. Van Waters and Rogers was reported to be a distributor of PCE for use by dry cleaners in the region. It was reported that an aboveground PCE tank was removed from the property in 1981.
3. We reviewed information from local files, aerial photographs and a drawing of the site prior to, and after, development of the study site. Based on this information, it appears that a portion of the study site was formerly occupied by a parking area associated with Van Waters and Rogers operations and the western portion of the building occupied by Van Waters and Rogers. (Van Waters and Rogers reportedly occupied the eastern portion of the building.) The aforementioned aboveground tank was apparently not located on the study site.
4. Studies conducted beginning in 1987 indicated groundwater contamination by PCE at the Westpark Center northwest and downgradient of the study sites.
5. Based on the foregoing studies and the detection of PCE in drinking water supplies of a trailer park downgradient of the study site, the State of Idaho has undertaken an areawide study to identify potential sources of PCE contamination. The State of Idaho believes that a potential source is the property formerly occupied by Van Waters and Rogers. As part of their study, they installed two groundwater monitoring wells at the former Van Waters and Rogers property and two wells upgradient of the property.
6. GZA performed six borings and installed observation wells at the study site. Soil and groundwater samples were collected and screened for volatile organic compounds. In addition, the two wells installed by the State were also sampled. PCE was detected in groundwater samples in five of eight monitoring wells. Analytical results detected PCE concentrations ranging from 56 ppb to 2,500 ppb. Wells where PCE was detected are located on the southern and western sections of the site indicating a northwest flow of contaminants. Verbal

information supplied by State of Idaho personnel indicated that no PCE was detected in monitoring wells installed upgradient of the study site.

7. Groundwater contamination appears to have moved across the study site to the northwest. Information currently available to GZA is not adequate to assess the extent of the plume, but PCE contamination has been reported at Westpark Center and a trailer park downgradient of the study site.



On the basis of the observations made and information reviewed during the course of this site evaluation, as described above, it is GZA's opinion that the available evidence indicates that hazardous material in the form of PCE, are present in the soil and groundwater at the site. A possible source of the contamination is from former users of an abutting property to the south.

8.00 LIMITATIONS

GZA's site evaluation was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area, and GZA observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. GZA's findings and conclusions must be considered not as scientific certainties, but rather as our professional opinion concerning the significance of the limited data gathered during the course of the environmental site evaluation. No other warranty, express or implied, is made. Specifically, GZA does not and cannot represent that the site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its site evaluation. This report is also subject to the Terms and Conditions contained in Appendix A.

This study and Report have been prepared on behalf of and for the exclusive use of the O'Connor Group, solely for use in an environmental evaluation of the site. This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party in whole or in part, without the prior written consent of GZA.

TABLES

TABLE 1

LIST OF LOCAL AND STATE CONTACTS
BOISE TOWNE SQUARE MALL - BOISE, IDAHO

STATE OFFICE AGENCY	CONTACT PERSON	DATE
Idaho DEQ Water Quality Div.	Bruce Wicherski	06-28-91
	Jon Wroten	06-28-91
	Mark Cantrell	06-28-91
Idaho DEQ Hazardous Materials Div.	Jolene Carol	06-28-91
	Ron Lane	07-09-91
	Lee Castanzo	07-11-91
CITY OF BOISE	CONTACT PERSON	DATE
Public Works Dept. Environmental Div.	Catherine Chertudi	06-27-91
		07-09-91
Fire Department	Capt. Wayland Johns	06-27-91
		07-09-91
Building Department	Bob Garrison	06-28-91
Permit Section	Clerk	06-28-91
Ada County	CONTACT PERSON	Date
Building and Planning	Clerk	06-28-91
Assessor's Office	Jeff Servatius	07-10-91
Misc. Contacts	CONTACT PERSON	Date
Owner of Quality Electric	Margerie Hintze	07-11-91
Vice President of Nielsen Transfer & Storage	VP/General Manger	07-11-91

TABLE 2

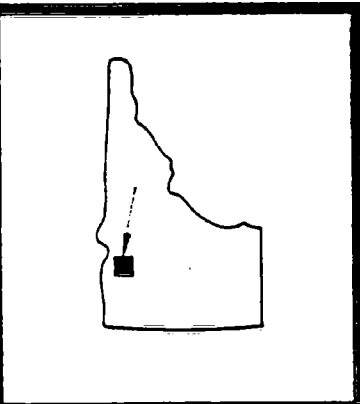
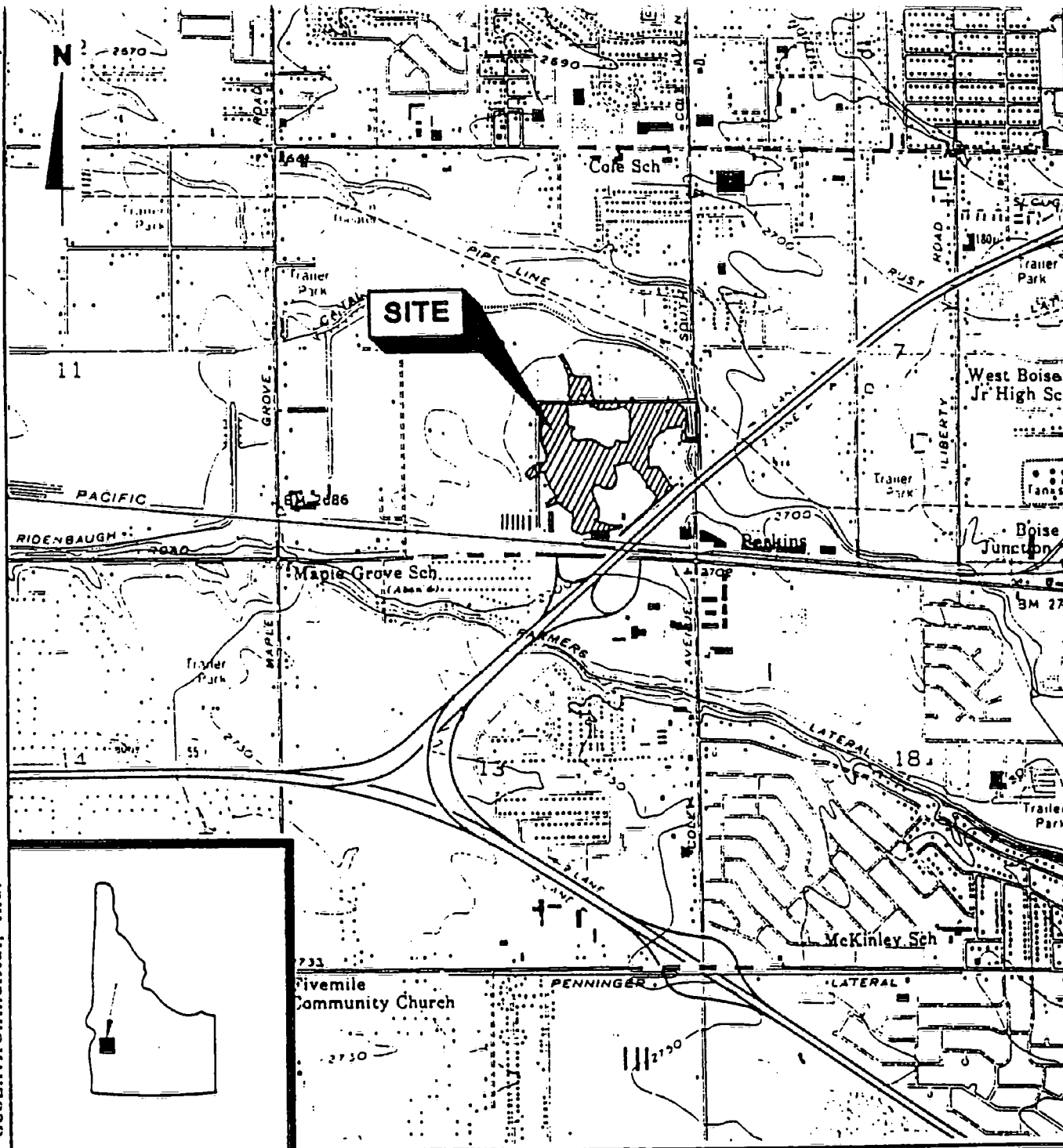
HNU SCREENING RESULTS
BOISE TOWNE SQUARE - BOISE, IDAHO

Boring No.	Sample No.	Depth (ft.)	Conc. (ppm)
GZ-1	S-1	0.5-2.5	ND
	S-2	5.0-7.0	ND
	S-3	10.0-11.0	1.0
	S-4	15.0-16.5	ND
	S-5	20.0-21.5	0.8
GZ-2	S-1	0.5-1.5	ND
	S-2	5.0-6.0	1.0
	S-3	10.0-12.0	ND
	S-4	15.0-16.0	ND
GZ-3	S-1	0.5-2.5	ND
	S-2	5.0-7.0	ND
	S-3	10.0-12.0	ND
	S-4	15.0-17.0	0.6
	S-5	20.0-22.0	ND
	S-7	30.0-31.5	1.8
GZ-4	S-1	0.5-2.5	ND
	S-2	7.0-8.0	ND
	S-5	20.0-21.0	7.6
GZ-5	S-1	0.2-2.5	ND
	S-2	5.0-6.0	ND
	S-4	15.0-16.0	ND
GZ-6	S-1	0.5-2.5	ND
	S-2	5.0-7.0	ND
	S-3	10.0-11.0	ND
	S-4	15.0-17.0	1.0

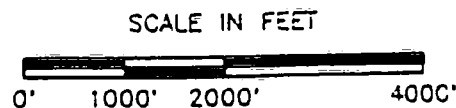
NOTES:

1. Soil samples were collected on 6-29-91 and 6-30-91 and screened on 7-3-91.
2. Samples not included in the above table were damaged during shipping and were unavailable for VOC screening.

FIGURES



FROM USGS CLOVERDALE, IDAHO QUADRANGLE MAP



BOISE TOWNE SQUARE

LOCUS PLAN

BOISE, IDAHO

JULY 1991

FIGURE NO. 1

APPENDIX A
LIMITATIONS/STATEMENT OF TERMS AND CONDITIONS

SITE ASSESSMENT LIMITATIONS

1. The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by Client. The work described in this report was carried out in accordance with the attached Statement of Terms and Conditions.
2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by state and local officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to GZA at the time of the site assessment. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site assessment.
3. In the event that bank counsel or title examiner for Client obtains information on environmental or hazardous waste issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.
4. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the site or to structures on the site was unavailable or limited, GZA renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, in that portion of the site or structure. In addition, GZA renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, where direct observation of the interior walls, floor, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces.
5. Unless otherwise specified in the report, GZA did not perform testing or analyses to determine the presence or concentration of asbestos or polychlorinated biphenyls (PCB's) at the site or in the environment at the site.
6. The purpose of this report was to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous material or oil, as defined in Massachusetts General Laws Chapter 21E. No specific attempt was made to check on the compliance of present or past owners or operators of the site with federal, state, or local laws and regulations, environmental or otherwise.
7. The conclusions and recommendations contained in this report are based in part upon the data obtained from a limited number of soil and/or groundwater samples obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further exploration. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
8. Water level readings have been made in the test pits, borings, and/or observation wells at the times and under the conditions stated on the test pit or boring logs. However, it must be noted that fluctuations in the level of groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.

9. Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses have been conducted by an outside laboratory, GZA has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.
10. The conclusions and recommendations contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. As indicated within the report, some of these data are preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA and the conclusions and recommendations presented herein modified accordingly.
11. Chemical analyses have been performed for specific parameters during the course of this site assessment, as described in the text. However, it should be noted that additional chemical constituents not searched for during the current study may be present in soil and/or groundwater at the site.
12. It is recommended that GZA be retained to provide further engineering services during construction and/or implementation of any remedial measures recommended in this report. This is to allow GZA to observe compliance with the concepts and recommendations contained herein, and to allow the development of design changes in the event that subsurface conditions differ from those anticipated.

STATEMENT OF TERMS AND CONDITIONS OF ENGAGEMENT

The terms and conditions set forth herein are incorporated, by reference, in the Proposal for Services, dated July 3, 1991, File Number RFP 91-111, directed to J. W. O'Connor Company, Inc. (the "Client").

This Proposal contains clauses that limit Company's liability to Client and require Client to indemnify Company for some claims for damages. The Proposal should be reviewed carefully, and Client may choose to consult with an attorney.

GZA GeoEnvironmental, Inc. ("Company") and Client agree as follows:

Section 1. Services. Company shall provide Client with the "Services" set forth in the Proposal for Services ("Proposal") with respect to the property identified in the Proposal (the "Site"), under the terms and conditions set forth herein. Company's Services will be performed on behalf of and solely for the exclusive use of Client for the purposes set forth in the Proposal and for no other purpose. Client acknowledges that Company's Services require decisions which are based upon judgment stemming from limited data rather than upon scientific certainties. Client, in accepting Company's Proposal, acknowledges the inherent risks to Client and its property associated with the work described in the Proposal and with underground work in general. Company reserves the right to refuse to undertake services on behalf of any project or on behalf of any prospective Client. Client acknowledges that other qualified persons and entities are available to carry out the proposed Services.

Section 2. Billing and Payment. Client will pay Company for services performed in accordance with the rates and charges set forth in the Proposal. Invoices for Company's services will be submitted on a periodic basis, or upon completion of Services, as Company shall elect. All invoices will be paid by Client within thirty (30) days after invoice date. Invoice balances remaining unpaid for thirty (30) days after invoice date will bear interest from invoice date at 1.5 percent per month or at the maximum lawful interest rate, if such lawful rate is less than 1.5 percent per month. If Client fails to pay any invoice in full within thirty (30) days after invoice date, Company may, at any time, and without waiving any other rights or claims against Client and without thereby incurring any liability to Client, elect to terminate performance of Services upon ten (10) days prior written notice by Company to Client. Notwithstanding any termination of Services by Company for non-payment of invoices, Client shall pay Company in full for all Services rendered by Company to the date of termination of Services plus all interest, termination costs and expenses incurred by Company and related to such termination. Client shall be liable to reimburse Company for all costs and expenses of collection, including reasonable attorneys' fees.

Company's non-exercise of any rights or remedies, whether specified herein or otherwise provided by law, shall not be deemed a waiver of any such rights or remedies, nor preclude Company from the exercise of such rights or other rights and remedies under this instrument, or at law.

Section 3. Insurance. Company maintains Workers Compensation Insurance with respect to its employees with statutorily required limits. Company maintains public liability and property damage insurance policies and professional errors and omissions. Certificates of Insurance evidencing such coverage will be provided to Client upon written request to the Client upon receipt of signed proposal.

Section 4. Right of Entry. Client grants to Company the right, exercisable from time to time, of entry to the Site by Company, its agents, employees, consultants, contractors and subcontractors, for the purpose of performing all acts, studies and research, including the making of test borings and other explorations as described in the Proposal. Should Client not own the Site, Client warrants and represents by acceptance of the Proposal that it has authority and permission of Site Owner and any Site occupant to grant Company this right of entry. Company may require evidence of such authority in a form reasonably satisfactory to Company.

Section 5. Subsurface Explorations.

(a) **Normal Disturbance** - Client acknowledges that the use of exploration equipment may affect, alter or damage the terrain, vegetation and buildings, structures, improvements and equipment at, in or upon the Site. Client accepts such risks. Company will not be liable for any effect, alteration or damage arising out of such explorations except that caused by Company's negligent acts. The cost of restoration of the Site because of any such damage has not been calculated nor included in Company's fees.

(b) **Subterranean Structures** - Company will exercise a reasonable degree of care in seeking to locate subterranean structures in the vicinity of proposed subsurface explorations at the Site. Company will contact public utilities and review plans, if any, provided by public utilities and public agencies and plans and information about the Site provided by Client. So long as Company observes such standard of care, Company will not be responsible for any damage, injury or interference with any subterranean structure, pipe, tank, cable or any other element or condition if not called to Company's attention prior to commencement of work or which is not shown, or accurately located, on any plans furnished to Company by Client or by any other party, (public or private).

Section 6. Samples

(a) **General** - Company will dispose of all soil, rock, water and other samples thirty (30) days after submission of Company's initial report. Client may request, in writing, that any such samples be retained beyond such date, and in such case Company will ship such samples to the location designated by Client, at Client's expense. Company may upon written request arrange for storage of samples at one of Company's offices, at mutually agreed storage charges. Company will not give Client prior notice of intention to dispose of samples.

(b) **Disposal of Hazardous Samples** - If samples collected from the Site contain substances defined as "hazardous" by Federal, state or local statutes, regulations, codes, or ordinances, Company shall have the right to: 1) dispose of samples by contract with a qualified waste disposal contractor; or 2) in accordance with Client's written directions, ship such samples by an appropriately licensed transporter to a licensed disposal site. Client shall pay all costs and expenses associated with the collection, storage, transport and disposal of samples. If Client requests, in writing, that any such sample be retained for a period in excess of thirty (30) days, Company will store such samples at Client's expense, and Client will pay an additional fee as charged by Company in accordance with its standard laboratory schedule for storage of samples of a hazardous nature.

Section 7. Construction Observation Services; Duties.

(a) **General** - Company, upon Client's written request, will provide personnel to observe and report to Client on specific aspects or phases of Client's project construction. Company's observation Services do not include any supervision or direction of work of any contractor or subcontractor, or their respective employees, agents or servants. Client shall notify each contractor and subcontractor that Company's observation Services do not include supervision or direction of the work and that neither the presence of Company's field representative nor the Services of observation and testing by Company, shall excuse the contractor or any subcontractor from the obligation to correct any defects then or thereafter discovered in the respective contractor's or subcontractor's work. Company will not be responsible for any contractor's or subcontractor's compliance with the provisions of any contract nor for the observation or supervision of any contractor's or subcontractor's use of personnel, machinery, equipment, safety precautions or procedures.

(b) **Construction Site Safety** - Company, by entering into an agreement with Client or by performing construction observation services, does not undertake any liability or responsibility for the development, supervision, or enforcement of any job or site safety requirements; nor for any failure of any contractor, subcontractor, or other third person or entity present on the Site to comply with the Occupational Safety and Health Act (Federal

OSHA), or with any regulations or standards promulgated thereunder, or with any state, county, or municipal law, regulation, or ordinance of similar import or intent.

Section 8. Documents. All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates and other documents, data or information are prepared by Company as instruments of Service, and will be the property of Client shall remain the sole property of Company. All reports and other work prepared by Company for Client shall be utilized solely for the intended purposes and Site described in the Proposal. Company will retain copies of all pertinent documents for a period of three (3) years following the submission of Company's report to Client. Such documents will be available to Client upon request at Company's office during office hours on reasonable notice, and copies will be furnished by Company to Client for the total cost of reproduction of the same. Any reuse of Company's instruments of service shall be its Client's sole risk unless Company shall authorize such reuse.

Section 9. Client's Duty to Notify Company of Hazards. Client represents and warrants that it will provide Company with any and all information known to or suspected by Client with respect to 1) the existence or possible existence at, on or under the Site of any hazardous materials, pollutants or asbestos as defined in the Federal Water Pollution Control Act; the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980; the Resource Conservation and Recovery Act of 1976, or under the provisions of federal, state, and local laws of similar import now or hereafter existing, 2) any condition known to Client to exist in, on, under or in the vicinity of the Site which might present a potential safety hazard or danger to human health or the environment, or 3) any permit, manifest, title record, or other record of compliance or non-compliance with any federal, state, or local laws relating in any way, directly or indirectly, to the past or present environmental conditions at the site.

Section 10. Hazardous Materials; Pollutants; Asbestos. If unanticipated potentially hazardous materials, pollutants or asbestos are encountered during the course of the work, Company shall have the right 1) to suspend its work immediately and 2) to terminate the work described in the Proposal, upon ten (10) days of Company's written notice of intent to terminate, unless Company and Client agree upon a mutually satisfactory amendment to the Proposal that may include a revision of the scope of services, adjustment of budget estimates, revised Terms and Conditions and revised fees. The Client may also direct the termination of work under these circumstances. Client shall remain liable for and shall pay all fees and charges incurred under the provisions of the Proposal through the date of termination, notwithstanding Client and Company not having reached a new, mutually satisfactory, revision of their agreement.

Section 11. Confidentiality. Company will not disclose information regarding the Proposal, Company's Services or its Report, except 1) to Client, 2) parties designated by

Client, or 3) as provided in Section 12 below. Information which is in the public domain or which is provided to the Company by third parties is excepted from the foregoing undertaking.

Section 12. Public Responsibility. Client acknowledges that the Client or the Site owner, as the case may be, is now and shall remain in control of the Site for all purposes at all times. Company does not undertake to report to any Federal, state, county or local public agencies having jurisdiction over the subject matter any conditions existing at the Site from time to time which may present a potential danger to public health, safety or the environment. Client, by acceptance of the Proposal, agrees that Client will timely notify each appropriate Federal, state, county and local public agency, as required by law, of the existence of any condition at the Site which may present a potential danger to public health, safety or the environment.

Notwithstanding the provisions of Section 11 and the foregoing, Company will comply with judicial orders or governmental directives, and federal, state, county and local laws, regulations and ordinances, and applicable codes regarding the reporting to the appropriate public agencies of findings with respect to potential dangers to public health, safety or the environment. Company shall have no liability or responsibility to Client or to any other person or entity for reports or disclosures made in accordance with such statutory or other lawful requirements. Client shall defend, indemnify and hold Company harmless from and against any and all claims, demands, liabilities and expense, including reasonable attorneys' fees, incurred by Company and arising directly or indirectly in connection with Company's reporting or disclosing such information under a bona fide belief or upon advice of counsel that such reporting or disclosure is required by law.

Section 13. Governing Law; Severability; Modifications; Assignment. Company maintains offices in several states. The agreement between Company and Client as set forth in the Proposal and in these Terms and Conditions shall be governed by and enforceable in accordance with the law of the jurisdiction in which Company's specific office issuing the Proposal is located. Such location shall be deemed the place of contracting.

The provisions of these Terms and Conditions are severable. The invalidity of any part of these Terms and Conditions shall not invalidate the remainder of these Terms and Conditions nor the remainder of any portion hereof.

These printed terms and conditions cannot be modified orally or by any course of conduct. Any modification must be acknowledged in writing by Company. These conditions shall take precedence over any inconsistent or contradictory provisions contained in any proposal, contract, purchase order, requisition, notice to proceed, or like document issued by Client. Client shall not assign any aspect of the agreement between Client and Company except upon the prior written consent of Company.

Section 14. Third Party Indemnity. Except in the case of damage caused by Company's negligence, Client agrees that Company has neither created nor contributed to the creation of any hazardous materials, pollutants, asbestos, or other potentially dangerous substance that is now or may be in the future discovered or introduced at the Site. ~~Company hereby states, and Client acknowledges by acceptance of the Proposal, that Company may not have any professional liability or other coverage insuring Company for acts, errors and omissions, and Company may be unable to obtain such insurance at reasonable cost, for claims arising out of the performance of services, including but not limited to, investigation, assessment or evaluation of hazardous materials or pollutants or the detection, abatement, removal or replacement of products, materials or processes containing asbestos.~~

Except in the case of damage caused by Company's negligence, Client agrees to defend, indemnify and hold harmless Company, its subcontractors, consultants, agents, officers, directors, and employees harmless from and against any and all claims for damages and all costs, liability or expense, whether direct, indirect, economic, or consequential, including reasonable attorneys' fees, and court and arbitration costs, sustained or alleged by any person or entity other than Client, based upon or arising in connection with: 1) a release of hazardous materials or pollutants; 2) bodily injury including death and property damage (real or personal) or any other claim of damage, expense or loss, caused by the release, removal, remediation, assessment, evaluation or investigation of hazardous materials or pollutants; 3) removal, assessment, evaluation or investigation of, or remedial action taken because of, the release or suspected release of hazardous materials or pollutants; 4) any federal, state, local or other governmental fines or penalties related to hazardous materials or pollutants; or 5) the detection, abatement, removal, or replacement of products, materials, or processes containing asbestos.

Section 15. Limitation of Professional Liability.

Client agrees that Company's liability to Client based upon claims arising out of Company's alleged breach of contract or negligent professional acts, errors or omissions is limited, in the aggregate, as follows:

(a) Company shall be liable for the first \$150,000 of damages so caused;

(b) Client shall bear that portion of damages so caused which falls between \$150,000 and \$250,000; and

(c) If Client's damages so caused exceed \$250,000, then it is agreed that Company's liability to Client for damages in excess of \$250,000 shall not exceed the amount of \$1,000,000 of applicable professional insurance then affording coverage to Company, its officers, directors and employees.

~~(a) General - Client agrees that Company's liability to Client based upon or arising out of Company's alleged breach of contract or negligent professional acts, errors or omissions is limited, in amount, to the aggregate sum of \$50,000 or Company's aggregate fee for services rendered on the subject project, whichever amount is greater.~~

~~(b) Construction Projects - Client agrees that Company's liability to Client and to any and all construction contractors and subcontractors for the project based upon claims arising as a result of Company's alleged breach of contract or negligent professional acts, errors or omissions is limited to the aggregate sum of \$50,000 or Company's aggregate fee for services rendered on the subject project, whichever is greater.~~

~~(c) Increased Limit of Professional Liability - Company, upon Client's written request, agrees to increase the limit of Company's liability for breach of contract or negligent professional acts, errors or omissions in consideration of additional payment by Client or other consideration deemed appropriate by Company at the time. The request for increased limit of professional liability must be made to Company in writing at the time of Client's acceptance of the Proposal.~~

~~Client may indicate a requested limit of liability by initialing and dating in the appropriate spaces below:~~

Limit of Liability	Additional Fee	Initials	Date
\$50,000	none	_____	_____
\$75,000	\$1,000	_____	_____
\$100,000	\$2,000	_____	_____

~~Any additional fee is due at the time of Client's request, and the increased limit of liability will become effective upon payment of the fee and execution of the Proposal. Additional monetary or other consideration given by Client for the additional economic risk assumed by Company shall not be construed as a charge for the placement or provision of additional professional liability insurance by Company.~~

Section 16. Mediation-Arbitration of Disputes

All claims, disputes or controversies arising out of, or in relation to this agreement shall be decided by a final and binding arbitration decision by the mediator-arbitrator in accordance with the procedures set forth in the remaining paragraphs of this section. This mediation-arbitration procedure shall not apply to disputes arising out of death or bodily

injury, or disputes arising out of alleged design defects or breaches of contract. The award of the mediator-arbitrator shall be binding on the parties and enforceable in any court of competent jurisdiction.

For the purposes of this section, PROJECT means all Services specified in the Scope of Work, annexed as Appendix C, including, but not limited to, all tests, professional services, and labor required to perform the Services and equipment incorporated or to be incorporated in such construction, DISPUTE means any claim, controversy, or other matter in question between the Client and GZA arising out of or relating to this Agreement for the provision of professional services or breach thereof; and PARTY means the Client or GZA or their respective insurers or sureties.

Any party shall request, in writing, mediation-arbitration of any dispute within 20 calendar days of the date that it knew or should reasonably have known of the dispute. In no event shall the demand for mediation-arbitration be made more than six (6) years from the date of substantial completion of the Services.

In the event that any party shall request mediation-arbitration of any disputes within the arbitrator's jurisdiction, as set forth in this section, Client and GZA shall attempt to resolve disputes within (7) calendar days of notification of the dispute by the party seeking mediation-arbitration. If any dispute is not resolved, Client and GZA should select by mutual agreement a neutral mediation-arbitration within seven (7) calendar days of the date of receipt by the other party of the written request for mediation-arbitration. In the event of failure to reach such agreement, or in any instance when the selected mediator-arbitrator is unable or unwilling to serve and a replacement cannot be agreed upon by the Client and GZA, such successor mediator-arbitrator shall be chosen as specified in the Construction Industry Arbitration Rules of the American Arbitration Association.

The mediator-arbitrator shall have authority to determine all procedural questions, including, but not limited to, any questions as to procedural arbitrability within the scope of his or her authority. Both parties specifically acknowledge that, in accordance with the first paragraph of this section above, the mediator-arbitrator in his/her own discretion, or on the application of any party, may mediate-arbitrate any such claim, which process may, but does not necessarily, include meeting individually with any party while excluding the other party or parties as determined with the discretion of the mediator-arbitrator.

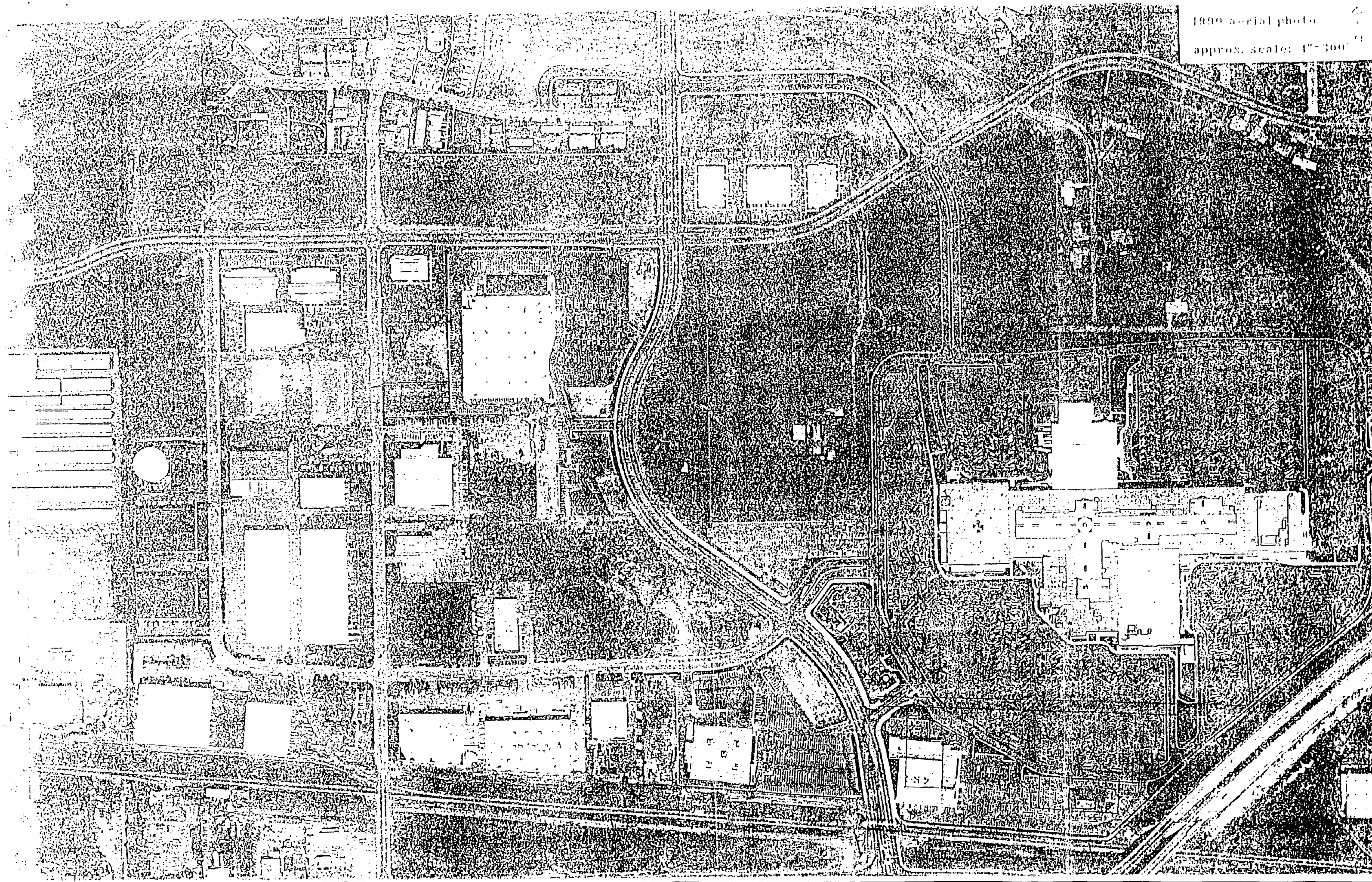
All communications with the mediator-arbitrator, including but not limited to, any demand for mediator-arbitration, shall be by certified mail to him/her and copies by certified mail to all other parties involved in said dispute. All mediator-arbitration shall be held at a location selected by mutual agreement between the Client and GZA. In the event of failure to reach such an agreement, the location shall be selected by the mediator-arbitrator. The fee of the mediator-arbitrator and the costs of transcription and such other costs

incurred by the mediator-arbitrator shall be apportioned equally between the parties. The parties mutually agree that the Construction Industry Arbitration Rules of the American Arbitration Association, where not inconsistent with the agreement, shall be applicable to any mediation-arbitration required by this agreement.

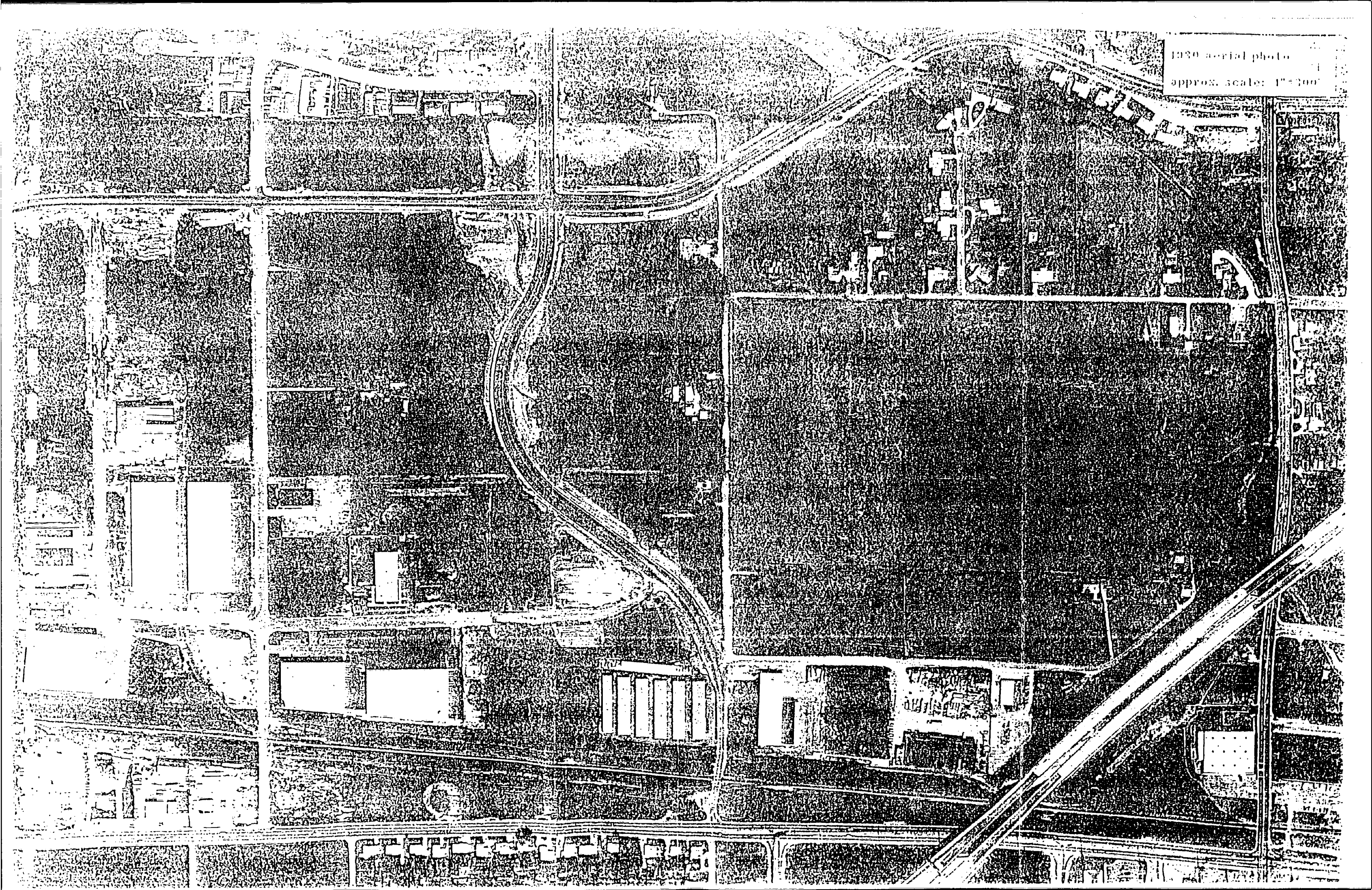
GZA GeoEnvironmental, Inc. is an
Equal Opportunity - Affirmative Action Employer
M/F/V/H

APPENDIX B
1990 AERIAL PHOTOGRAPHS OF SITE

1990 aerial photo
approx. scale: 1"=300'

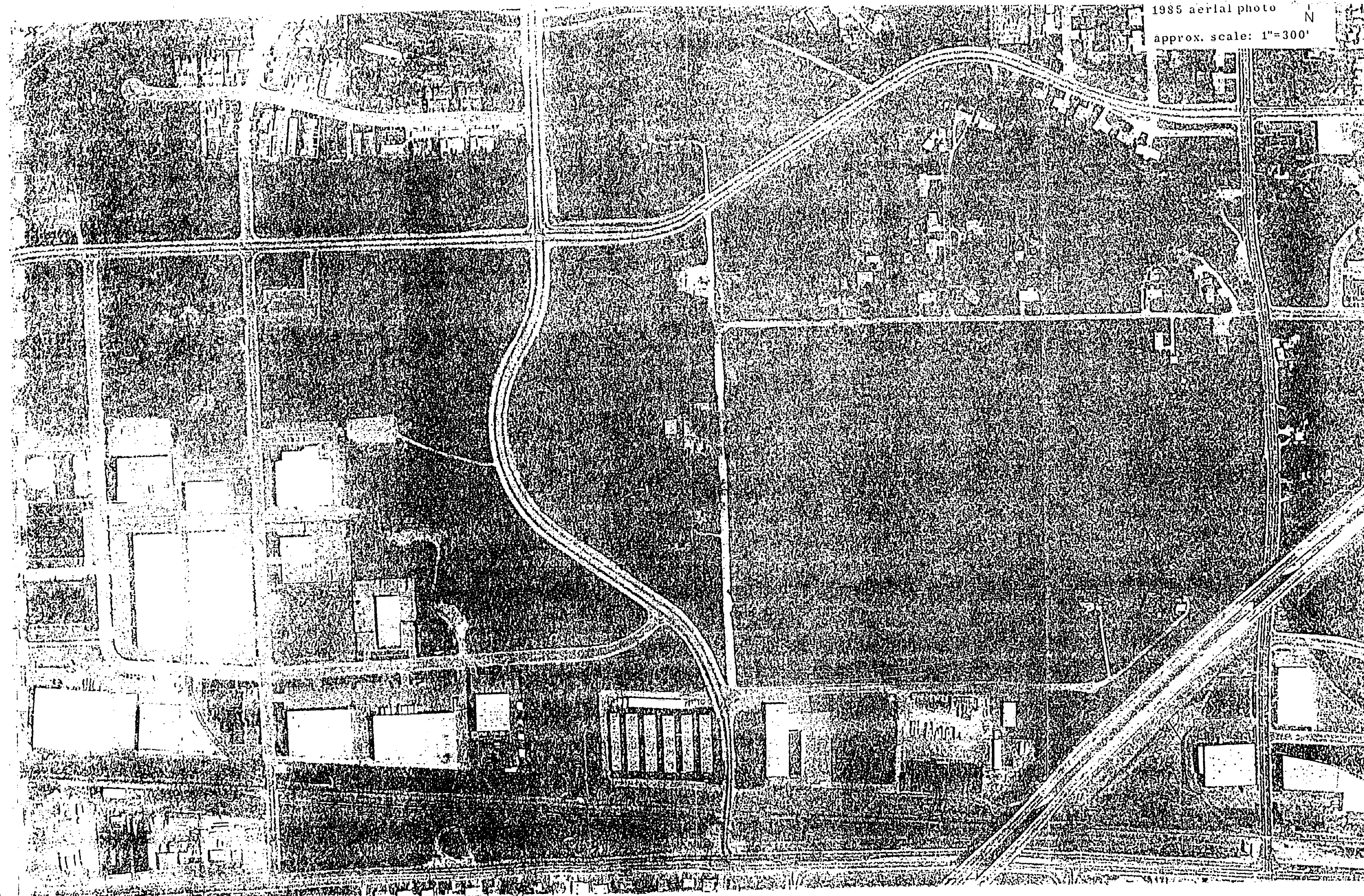


1930 aerial photo
approx. scale: 1"=200'

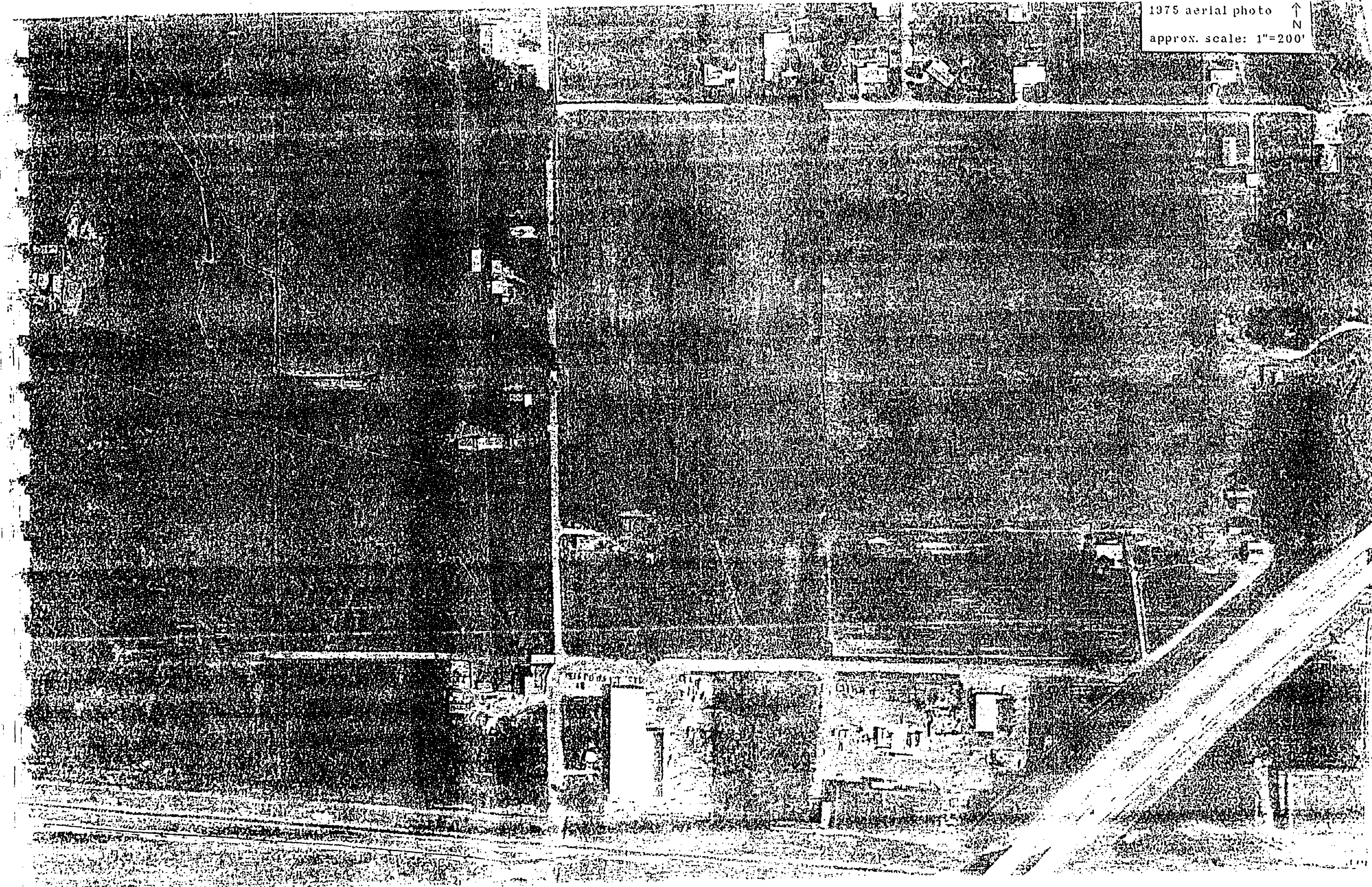


1985 aerial photo
approx. scale: 1"=300'

N



1975 aerial photo ↑
N
approx. scale: 1"=200'



APPENDIX C
GZA BORING LOGS

ZA GEO ENVIRONMENTAL INC.
40 BROADWAY, PROVIDENCE, RHODE ISLAND
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
BOISE TOWN SQUARE
Boise, Idaho

REPORT OF BORING No. GZ-1
SHEET 1 OF 1
FILE No. Y-12600.00
CHKD. BY

BORING Co. Environmental West Exploration, Inc.
OREMAN TIM SMITH
ZA ENGINEER William Paul

BORING LOCATION Refer to Exploration Location Plan
GROUND SURFACE ELEVATION DATUM
DATE START 6-29-91 DATE END 6-29-91

SAMPLER: SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING
140 LB. HAMMER FALLING 30 IN.

ASING: 6" DIAMETER CASING ADVANCED WITH COEX DRILL BIT

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
6-30-91		15.7	OW	1 day

DEPTH FEET	C S A M P L E S	SAMPLE				SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
		No.	PEN./ REC.	DEPTH (Ft.)	BLOWS/6"					
5		S-1	24/10	5-2.5	8-28	Very dense, brown, Clayey SILT, some fine to coarse Gravel and broken Cobbles, little fine to medium Sand	ASPHALT	Native Backfill and Concrete		1.
				29-31	4"+					
					CLAYEY SILT					
					7'+					
10		S-2	24/20	5-7	6-13	Dense, brown Clayey SILT, trace fine Sand		Bentonite Holeplug		
				23-22						
15		S-3	12/6	10-11	20-83	Very dense, brown, fine to coarse SAND, Gravel and Cobble Fragments, trace Silt	FINE TO COARSE SAND, GRAVEL AND COBBLES			
20		S-4	18/10	15-16.5	6-50	Very dense, brown, fine to coarse SAND, Gravel and Cobble Fragments, trace Silt - bottom 6-inches of sample wet		Filter Sand		
				84						
25		S-5	18/8	20-21.5	6-50	Very dense, brown, fine to coarse SAND, Gravel and Cobble Fragments, trace Silt - sample saturated				2. 3. 4.
				60						
30						Bottom of Boring at Approximately 25 Feet				
35										

REMARKS:

1. Cobbles/boulders from approximately 6.5 to 9 feet.

2. No apparent chemical odors or staining observed on any of the soil samples.

3. A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 23.5 feet. The well consists of 10 feet of slotted (0.0 inch) well screen from 13.5 to 23.5 feet and 13.5 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 11.5 to 23.5 feet and a bentonite holeplug seal was placed just above the sand from approximately 6 to 11.5 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut.

4. Groundwater measurements relative to ground surface.

NOTES:

1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No. GZ-1

REPORT OF BORING No. GZ-2
SHEET 1 OF 1
FILE No. Y-12600.00
CHKD. BY _____

BORING LOCATION Refer to Exploration Location Plan
GROUND SURFACE ELEVATION _____ DATUM _____
DATE START 6-29-91 DATE END 6-29-91

ASING: 6" DIAMETER CASING ADVANCED WITH ODEX DRILL BIT.

DATE	TIME	WATER	CASING	STABILIZATION TIME
6-30-91		17.4	OW	1 day

REMARKS:

1. No apparent chemical odors or staining observed on any of the soil samples.
2. A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 24.5 feet. The well consists of 10 feet of slotted (0.01 inch) well screen from 14.5 to 24.5 feet and 14.5 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 12.5 to 24.5 feet and a bentonite holeplug seal was placed just above the sand from approximately 3 to 12.5 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut.
3. Groundwater measurements relative to ground surface.

ZA

BORING No. GZ-2

A GEO. ENVIRONMENTAL, INC. 10 BROADWAY, PROVIDENCE, RHODE ISLAND GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS					PROJECT <u>BOISE TOWN SQUARE</u> <u>BOISE, IDAHO</u>		REPORT OF BORING No. <u>GZ-3</u> SHEET <u>1</u> OF <u>1</u> FILE No. <u>Y-12600.00</u> CHKD. BY _____	
BORING Co. <u>Environmental West Exploration, Inc.</u> DREMAN <u>Tim Smith</u> ENGINEER <u>William Paul</u>					BORING LOCATION Refer to Exploration Location Plan GROUND SURFACE ELEVATION _____ DATUM _____ DATE START <u>6-29-91</u> DATE END <u>6-30-91</u>			

SAMPLER: SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 LB. HAMMER FALLING 30 IN. USING: 6" DIAMETER CASING ADVANCED WITH ODEX DRILL BIT.					GROUNDWATER READINGS				
					DATE	TIME	WATER	CASING	STABILIZATION TIME
					6-30-91		22.8	OW	.5 day

C B L O W S	SAMPLE				SAMPLE DESCRIPTION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED		FIELD TESTING	REMARKS	
	No.	PEN./ REC.	DEPTH (Ft.)	BLOWS/6"							
	S-1	24/12	.5-2.5	10-23 33-45	Very dense, brown, fine to coarse SAND and Gravel, trace Silt Dense, brown, fine to coarse SAND and Gravel, some Silt	ASPHALT					
						4"+					SAND AND GRAVEL FILL
5	S-2	24/8	5-7	12-22 23-17		8'+					
					Medium dense, brown CLAYEY SILT, trace fine Sand, trace Roots	CLAYEY SILT					
10	S-3	24/22	10-12	8-13 7-7		14'+					
					Very dense, brown, fine to coarse SAND and Gravel, trace Silt Very dense, gray-brown, fine to coarse Gravel and Cobble Fragments, some fine to coarse Sand	FINE TO COARSE SAND, GRAVEL AND COBBLES					
15	S-4	24/10	15-17	22-31 34-40							Bentonite Holeplug
					Very dense, gray-brown, fine to coarse Gravel and Cobble Fragments, some fine to coarse Sand Very dense, gray-brown, fine to coarse Gravel and Cobble Fragments, some fine to coarse Sand						
20	S-5	24/6	20-22	23-27 43-44							Filter Sand
					Very dense, gray-brown, fine to coarse Gravel and Cobble Fragments, some fine to coarse Sand Very dense, brown, fine to coarse SAND and Gravel						
25	S-6	12/8	25-26	18-80							
					Very dense, brown, fine to coarse SAND and Gravel						
30	S-7	18/8	30-31.5	6-30 50							
					Bottom of Boring at Approximately 35 Feet						

REMARKS:

- No apparent chemical odors or staining observed on any of the soil samples.
- A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 34 feet. The well consists of 10 feet of slotted (0.01 inch) well screen from 25 to 35 feet and 25 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 23 to 35 feet and a bentonite holeplug seal was placed just above the sand from approximately 16 to 23 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut.
- Groundwater measurements relative to ground surface.

NOTES:

- STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.
- WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

2A

BORING No. GZ-3

2A GEO ENVIRONMENTAL INC.
40 BROADWAY, PROVIDENCE, RHODE ISLAND

PROJECT
BOISE TOWN SQUARE
BOISE, IDAHO

REPORT OF BORING No. GZ-4
SHEET 1 OF 1
FILE No. Y-12600.00
CHKD. BY

GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

BORING Co. Environmental West Exploration, Inc.
BOREMAN Tim Smith
2A ENGINEER William Paul

BORING LOCATION Refer to Exploration Location Plan
GROUND SURFACE ELEVATION DATUM
DATE START 6-30-91 DATE END 6-30-91

SAMPLER: SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 LB. HAMMER FALLING 30 IN.

ASING: 6" DIAMETER CASING ADVANCED WITH ODEX DRILL BIT.

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
6-30-91		11.4	OW	.5 day

C A S I N G S	B L O W S	SAMPLE				SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMARKS
		No.	PEN./ REC.	DEPTH (FT.)	BLOWS/6"					
5		S-1	24/10	5-2.5	4-5	Medium dense, brown, fine to coarse SAND and Clayey SILT, some fine to coarse Gravel Cobbles at 5-7' interval	4"± ASPHALT	Native Backfill and Concrete		
				10-17	FINE TO COARSE SAND AND CLAYEY SILT					
					3'±					
					FINE TO COARSE SAND AND GRAVEL					
0		S-2	12/2	7-8	17-50	Very dense, brown, fine to coarse GRAVEL and Cobble Fragments. Some fine to coarse Sand		Bentonite Holeplug		
15		S-3	18/8	10-11.5	11-25	Very dense, brown, fine to coarse SAND and Gravel		Filter Sand		
				36						
0		S-4	12/8	15-16	5-50	Very dense, brown, fine to coarse SAND and Gravel - sample saturated				
0		S-5	12/6	20-21	27-50	Very dense, brown, fine to coarse SAND and Gravel	21'±			1.5'
25										
30										
35										

REMARKS:

1. No apparent chemical odors or staining observed on any of the soil samples.

2. A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 20 feet. The well consists of 10 feet of slotted (0.01 inch) well screen from 10 to 20 feet and 10 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 8 to 20 feet and a bentonite holeplug seal was placed just above the sand from approximately 2 to 8 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut.

3. Groundwater measurements relative to ground surface.

NOTES:

1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.

2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

2A

BORING No. GZ-4

ZA GEO ENVIRONMENTAL, INC. 40 BROADWAY, PROVIDENCE, RHODE ISLAND GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS		PROJECT BOISE TOWN SQUARE Boise, Idaho		REPORT OF BORING No. GZ-5 SHEET 1 OF 1 FILE No. Y-T2600.00 CHKD. BY	
BORING Co. Environmental West Exploration, Inc. OREMAN TIM SMITH ZA ENGINEER WILLIAM PAUL		BORING LOCATION Refer to Exploration Location Plan GROUND SURFACE ELEVATION DATUM DATE START 6-30-91 DATE END 6-30-91			

SAMPLER: SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 LB. HAMMER FALLING 30 IN.

ASING: 6" DIAMETER CASING ADVANCED WITH COEX DRILL BIT.

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7-1-91		10.2	OW	1 day

DEPTH FEET	C B L O W S	SAMPLE				SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED		FIELD TESTING	RE M A R K S
		No.	PEN./ REC.	DEPTH (Ft.)	BLOWS/6"						
5		S-1	24/18	.5-2.5	2-4	Medium dense, brown CLAYEY SILT, little fine Sand, little fine to coarse Gravel	ASPHALT	<div></div>	Native Backfill and Concrete		
				7-10	4"+ CLAYEY SILT						
					5'+						
0		S-2	12/5	5-6	48-50	Very dense, gray-brown, fine to coarse GRAVEL and Cobble Fragments, some fine to coarse Sand	FINE TO COARSE SAND, GRAVEL AND COBBLES	<div></div>	Bentonite Holeplug		
15		S-3	12/4	10-11	8-50	Very dense, gray-brown, fine to coarse GRAVEL and Cobble Fragments, little fine to coarse Sand		<div></div>	Filter Sand		
0		S-4	12/6	15-16	13-50	Very dense, gray-brown, fine to coarse GRAVEL and Cobble Fragments, little fine to coarse Sand	20'+	<div></div>			1. 2. 3.
30						Bottom of Boring at Approximately 20 Feet					
75											

- REMARKS:
- No apparent chemical odors or staining observed on any of the soil samples.
 - A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 19 feet. The well consists of 10 feet of slotted (0.01 inch) well screen from 9 to 19 feet and 9 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 7 to 19 feet and a bentonite holeplug seal was placed just above the sand from approximately 4 to 7 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut.
 - Groundwater measurements relative to ground surface.

ZA GEO ENVIRONMENTAL, INC. 40 BROADWAY, PROVIDENCE, RHODE ISLAND GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS					PROJECT BOISE TOWN SQUARE BOISE, IDAHO		REPORT OF BORING No. GZ-6 SHEET 1 OF 1 FILE No. Y-12600.00 CHKD. BY				
BORING Co. Environmental West Exploration, Inc. OREMAN TIM SMITH ZA ENGINEER WILLIAM PAUL					BORING LOCATION Refer to Exploration Location Plan GROUND SURFACE ELEVATION DATUM DATE START 6-30-91 DATE END 6-30-91						
SAMPLER: SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 LB. HAMMER FALLING 30 IN. ASING: 6" DIAMETER CASING ADVANCED WITH ODEX DRILL BIT.					GROUNDWATER READINGS						
					DATE	TIME	WATER	CASING	STABILIZATION TIME		
					7-1-91		13.9	OW	1 day		
C A S I N G S	B L O W S	SAMPLE			SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED		FIELD TESTING	REMARKS	
		No.	PEN./ REC.	DEPTH (Ft.)							BLOWS/6"
		S-1	24/18	0.5-2.5	17-23 18-36	Dense, brown, fine to coarse SAND, Gravel and Silt	ASPHALT 4"+ SAND AND GRAVEL FILL 5'+			Native Backfill and Concrete	
5		S-2	24/18	5-7	8-17 14-19	Dense, brown CLAYEY SILT, little fine to coarse Sand	CLAYEY SILT 10'+			Bentonite Holeplug	
0		S-3	12/6	10-11	6-50	Very dense, brown, fine(+) to coarse SAND, some fine to coarse Gravel and Cobble Fragments, little Silt	FINE TO COARSE SAND AND GRAVEL				
15		S-4	24/8	15-17	6-31 30-32	Very dense, brown, fine to coarse SAND and Gravel - sample saturated				Filter Sand	
0		S-5	18/0	20-21.5	3-6 18	No Recovery	23'+				1. 2. 3.
25						Bottom of Boring at Approximately 23 Feet					
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											
80											
85											
90											
95											
100											
REMARKS: 1. No apparent chemical odors or staining observed on any of the soil samples. 2. A 2-inch diameter, Sch. 40 PVC well was installed to a depth of approximately 23 feet. The well consists of 10 feet of slotted (0.01 inch) well screen from 13 to 23 feet and 13 feet of riser to ground surface. Filter sand was placed in the annulus around the well screen from approximately 11 to 23 feet and a bentonite holeplug seal was placed just above the sand from approximately 3 to 11 feet. The remainder of the borehole was backfilled with native material. The well is capped off with a flush mounted protective cover cemented in place and bolted shut. 3. Groundwater measurements relative to ground surface.											
NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. 2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE											
ZA										BORING No. GZ-6	

APPENDIX D

GZA ENVIRONMENTAL CHEMISTRY LABORATORY SOIL AND GROUNDWATER RESULTS AND PROCEDURES

GZA RAPID VOLATILE ORGANIC SCREENING OF WATER SAMPLES BY THE STATIC HEADSPACE TECHNIQUE

SAMPLE PREPARATION AND ANALYTICAL METHODOLOGY

OVERVIEW

The GZA rapid screening technique for volatile organics in water estimates aqueous concentrations of these compounds from gaseous concentrations measures in air over the sample. Dissolved volatile organics are driven from the water phase by equilibrating at an elevated temperature in a hermetic system containing the sample and clean air. An aliquot of the equilibrated headspace gas is injected into the chromatograph to provide an evaluation of the quality of the water sample. This method has been developed by the GZA Environmental Chemistry Laboratory to provide rapid and cost effective screening of water samples for volatile organics. Although this technique is a modification of EPA Method 3810, it is not definitive and is not approved by the EPA for certification purposes.

METHODOLOGY

Water samples taken in the field are placed in 40 ml glass septum vials filled to capacity and capped to exclude air bubbles. Vials are preserved with 250 ul of 1:1 hydrochloric acid and samples are kept at 4 degrees C until the time of analysis. In preparing the sample for analysis, a volume ratio of 3:1 sample to headspace (air) is created by discarding 10 ml of sample (replaced by air) from the 40 ml vial or transferring 7.5 ml to a 10 ml crimp-top septum vial. The vial is resealed and heated to 40 degrees C in a thermostatically controlled bath. A 1.0 ml aliquot of headspace gas is withdrawn manually with a syringe or automatically by a Hewlett Packard 19395A headspace injector. The headspace sample is injected into the sample port of a HP 5890A gas chromatograph where the vapor is split within the injection port and distributed to two 30 meter x 530 micron fused silica capillary columns. Concentrations of eluting volatile organics are measured with dual flame ionization detectors and response data are acquired by a Nelson Analytical 760 Series Intelligent Interface. The chromatographic data are transmitted to an IBM AT personal computer and analyzed using the Nelson Analytical 2600 Series Chromatography Software. The information for the analytical report is entered manually onto a Lotus Symphony spreadsheet.

CALIBRATION

The response of the gas chromatograph is calibrated with external standards prepared for concentrations of 0.1, 1.0 and 10 mg/l (ppm) and introduced into the chromatograph as headspace samples in the same manner as unknown water samples. Sample peaks are identified by comparing their retention times from both columns to measures retention times of calibration standards for both columns. Qualitative comparisons are made between the two sets of test data for each sample. Sample peaks identified as known compounds are quantified according to response factors determined from calibration standards.

REPORT FORMAT

The method detection limit (MDL) for each compound is stated for every report with 95% certainty in an average chromatographic run. The method quantitation limit (MQL) is considered to be 5 times the MDL. Concentrations measured in the range of 1 to 5 times the MDL are reported as "TRACE". Concentrations less than the MDL may be identified and qualified as beneath the method detection limit (BMDL) in instances where the compound's presence is 95% certain in that particular chromatogram. The total concentration for all detected compounds for which a calibration has been made, except methane, is summarized in the row designated as "Total Compounds"; none detected, (ND) is reported if no known peaks are found. Unidentifiable peaks are reported in parentheses as the number of unknown peaks present. Compounds not detected are reported as "ND".

QUALITY CONTROL

The GZA procedure assumes that response factors are constant over the working range of 10 ppb to 10 ppm and that the precision of the analysis for samples is the same as that for the calibration standards. The 95% confidence limits for a measurement are defined as plus or minus two standard deviations as determined by a Student's t Test on replicate analyses of calibration standards. Quality control standards are analyzed daily and accepted if the relative standard deviation of the response factor is less than 20% of the anticipated value. New calibration curves are prepared when quality control limits are exceeded. Method blanks are prepared in the same manner as samples and are analyzed before each job or no less frequently than every six samples. Field blanks and trip blanks are submitted at the discretion of the sample submitter. Matrix spikes and duplicate analyses are performed at a frequency of not less than one per twenty or fewer samples and results are reported as matrix spike recoveries and percent differences. Analytical results are not blank corrected.

DISCLAIMER

Identities and concentrations of volatile organic compounds reported by this headspace screening technique are subject to limitations inherent to this method. If confirmation is desired, duplicate samples should be submitted to a State certified laboratory for analysis by the appropriate EPA protocol methods.

LABORATORY SAMPLE NOTATION:

A - Aqueous

B - Blank

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6/91/EWP-DM

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GZA GAS CHROMATOGRAPHIC SCREENING FOR VOLATILE ORGANICS
IN AQUEOUS AND/OR SOLID MATRIX
QUALITY CONTROL

DATE: 7/3/91

AQUEOUS

COMPOUNDS	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE PERCENT DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Trichloroethene	94.5	70-130	5.3	35
Toluene	95.5	70-130	5.0	35

SOLID

COMPOUNDS	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE PERCENT DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
Trichloroethene	95.6	70-130	10.0	35
Toluene	101.6	70-130	12.3	35

JOB DESCRIPTION: BOISE TOWN SQUARE MALL - BOISE, IDAHO

JOB #: 12600

DATE SAMPLED: 6/29/91 - 7/1/91

DATE TESTED: 7/3/91

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LAB I.D. No.: MA092

GZA GC SCREENING FOR VOLATILE ORGANICS IN WATER
(CONCENTRATION - PPB, ug/l)

SAMPLE NAME: GZA LAB #:	Method Blank 06483-B	GZ-1 36483-A	GZ-2 36484-A	GZ-3 36485-A	GZ-4 36486-A	GZ-5 36487-A	METHOD DETECTION LIMIT
1. TETRACHLOROETHENE	ND	ND	ND	ND	1,400	56	10
2. TRICHLOROETHENE	ND	ND	ND	ND	TRACE	ND	10
3. 1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	10
4. TOTAL 1,2- DICHLOROETHENES	ND	ND	ND	ND	ND	ND	10
5. VINYL CHLORIDE	ND	ND	ND	ND	ND	ND	10
6. METHYLENE CHLORIDE	ND	ND	ND	ND	ND	ND	50
7. 1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	10
8. 1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	10
9. 1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	50
10. CHLOROETHANE	ND	ND	ND	ND	ND	ND	10
11. METHYL- <i>t</i> -BUTYL ETHER	ND	ND	ND	ND	ND	ND	30
12. BENZENE	ND	ND	ND	ND	ND	ND	5.0
13. TOLUENE	ND	ND	ND	ND	ND	ND	5.0
14. ETHYL BENZENE	ND	ND	ND	ND	ND	ND	5.0
15. <i>m,p</i> -XYLENES	ND	ND	ND	ND	ND	ND	5.0
16. <i>o</i> -XYLENE	ND	ND	ND	ND	ND	ND	5.0
17. CHLOROFORM	ND	ND	ND	ND	ND	ND	50
18. FREON 113 (CCl3-CF3)	ND	ND	ND	ND	ND	ND	20
19. CHLOROBENZENE	ND	ND	ND	ND	ND	ND	10
20. STYRENE	ND	ND	ND	ND	ND	ND	10
TOTAL COMPOUNDS (1-20)	ND	ND	ND	ND	1,400	56	
METHANE (V/V-air, PPM)	ND	ND	40	23	ND	ND	10 PPM
UNKNOWN(S) (#)	ND	ND	(2)	ND	ND	ND	

COMMENTS: Results are reported with two (2) significant digits. Trace levels of two (2) early eluting unknown compounds were detected in sample GZ-2 that are possibly products of microbial degradation.

ANALYZED BY

Julie Blackwell

REVIEWED BY:

CW Pukering

JOB DESCRIPTION: BOISE TOWN SQUARE MALL - BOISE, IDAHO

JOB #: 12600

DATE SAMPLED: 6/29/91 - 7/1/91

DATE TESTED: 7/3/91

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LAB I.D. No.: MA092

GZA GC SCREENING FOR VOLATILE ORGANICS IN WATER
(CONCENTRATION - PPB, ug/l)

SAMPLE NAME: GZA LAB #:	Method Blank 06483-B	GZ-6 36488-A	MW-1 36489-A	MW-2 36490-A	Trip Blank 36491-B	METHOD DETECTION LIMIT
1. TETRACHLOROETHENE	ND	490	2,500	110	ND	10
2. TRICHLOROETHENE	ND	ND	TRACE	ND	ND	10
3. 1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	10
4. TOTAL 1,2-DICHLOROETHENES	ND	ND	ND	ND	ND	10
5. VINYL CHLORIDE	ND	ND	ND	ND	ND	10
6. METHYLENE CHLORIDE	ND	ND	ND	ND	ND	50
7. 1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	10
8. 1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	10
9. 1,2-DICHLOROETHANE	ND	ND	ND	ND	ND	50
10. CHLOROETHANE	ND	ND	ND	ND	ND	10
11. METHYL-t-BUTYL ETHER	ND	ND	ND	ND	ND	30
12. BENZENE	ND	ND	ND	ND	ND	5.0
13. TOLUENE	ND	ND	ND	ND	ND	5.0
14. ETHYL BENZENE	ND	ND	ND	ND	ND	5.0
15. m,p-XYLENES	ND	ND	ND	ND	ND	5.0
16. o-XYLENE	ND	ND	ND	ND	ND	5.0
17. CHLOROFORM	ND	ND	ND	ND	ND	50
18. FREON 113 (CCl3-CF3)	ND	ND	ND	ND	ND	20
19. CHLOROBENZENE	ND	ND	ND	ND	ND	10
20. STYRENE	ND	ND	ND	ND	ND	10
TOTAL COMPOUNDS (1-20)	ND	490	2,500	110	ND	
METHANE (V/V-air, PPM)	ND	ND	53	110	ND	10 PPM
UNKNOWN(S) (#)	ND	(1)	(2)	(3)	ND	

COMMENTS: Results are reported with two (2) significant digits. Trace levels of early eluting unknown compounds were detected in samples GZ-6, MW-1, and MW-2 that are possibly products of microbial degradation.

ANALYZED BY

Julie Blackwell

REVIEWED BY:

CW Pichering

**GZA HYDROCARBON FINGERPRINTING TECHNIQUE
BY GAS CHROMATOGRAPHY-FLAME IONIZATION DETECTION
(PHC FINGERPRINT, GC-FID)**

OVERVIEW

The methodology employed by GZA to determine hydrocarbon content in solid and aqueous environmental samples is a modification of ASTM Method D3328-78 in conjunction with a method developed by the U.S. Coast Guard. Data obtained by this method include an accurate total concentration of hydrocarbon content and an identification based on comparisons with laboratory petroleum standards. Identifications may also be made utilizing a virgin petroleum product acquired from a suspected source at the site.

METHODOLOGY

Solid samples are extracted using a 30 gram subsample which is initially mixed with anhydrous sodium sulfate (Na_2SO_4) to remove water from the matrix. The sample is subsequently mixed with pentane to form a slurry which is then extracted via sonic disruption. This process is repeated three times and the collected extract is cleaned up using a silica gel solid phase extraction (SPE) column. The collected elutriate is automatically concentrated to a 1 milliliter volume with a Zymark Turbovap Evaporator to enhance detection limits of the method. Aqueous samples are extracted using a 200ml aliquot in a liquid/liquid extraction device using the solvent pentane. The extraction is repeated three times and the resulting extract is prepared following the same method as with solid environmental samples.

INSTRUMENTATION

The prepared extract is analyzed for hydrocarbon content using a Hewlett Packard Model 5890A Gas Chromatograph equipped with twin flame ionization detectors and a dual column capillary inlet system. The two Megabore capillary columns chosen for the analysis are a 30meter DB-5 and a 30meter DB-1. The sixty-five minute analysis is electronically controlled by a HP 7673A Autosampler and data are acquired with a Nelson Analytical 760 Series Intelligent Interface. The chromatographic data are then transmitted to an IBM AT personal computer and analyzed using the Nelson Analytical 2600 Series Chromatographic Software. The information for the analytical report is entered manually onto a Lotus Symphony Spreadsheet. The automation of the system allows the analyst to set optimum sample arrangement including calibration standards, method blanks, and duplicates.

QUALITY CONTROL

The gas chromatograph is calibrated using an average response factor determined for hydrocarbons that is calculated from internal and surrogate standards. The calibration is checked with every batch of samples by analyzing petroleum hydrocarbons of known concentration. Identification of petroleum product type is made by comparison with laboratory standards or with suspect petroleum sources on an individual site basis. Tracer compounds such as the isomer pair phytane/ n-octadecane are routinely used to determine the degree of product "weathering" as in the case of fuel oil number 2. The surrogate standard o-terphenyl is added to samples and method blanks to determine the extraction efficiency of the applied method as a surrogate recovery.

REPORT FORMAT

The method detection limit for total hydrocarbon content has been determined empirically and is modified for each sample as a function of the dilution factor. The total concentration is summarized in the row labeled "Hydrocarbon Content". All reported results for hydrocarbon analysis environmental samples are reported in ug/g (ppm) unless otherwise indicated. Detection limits for individual hydrocarbons are reported for the purpose of determining levels of priority pollutant constituents of petroleum such as polyaromatic hydrocarbons (PAH's). Surrogate recoveries are reported for all method blanks and samples.

DISCLAIMER

Identities and concentrations of petroleum hydrocarbons reported in this analytical method are subject to the limitations inherent in the cited methods. This method is not an approved EPA method but is currently undergoing a review by the ASTM Committee D-29 on water for upgrades and certification.

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HYDROCARBON FINGERPRINTING
MODIFIED ASTM METHOD D3328
CONCENTRATION (PPM-ug/g or ug/ml)

JOB DESCRIPTION: BOISE TOWNE SQUARE MALL - BOISE, IDAHO
JOB #: 12600
DATE SAMPLED: 7/1/91
DATE TESTED: 7/5/91

SAMPLE NAME: GZA LAB #:	METHOD BLANK 070591-QC	GZ-4 02670-PHC
1. HYDROCARBON CONTENT	<0.5	<0.5
2. PERCENT SOLID CONTENT	N/A	N/A
3. MATRIX	N/A	AQUEOUS
4. DETECTION LIMIT (TOTAL PRODUCT)	0.5	0.5
5. DETECTION LIMIT (INDIVIDUAL HYDROCARBONS)	0.02	0.02
6. SURROGATE RECOVERY (O-TERPHENYL)	74%	78%

QUALITATIVE IDENTIFICATION: N/A

ANALYZED BY:

L. Wall

REVIEWED BY:

M. P. Riberio